VOLUME XX FEBRUARY 1927 NUMBER 2

Southern Medical Journal

Journal of The Southern Medical Association

Published monthly by the Southern Medical Association, Empire Building, Birmingham, Ala. Annual subscription $4.00. Entered as Second-Class Matter at the Post Office at Birmingham, Ala., under Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1103, Act of Oct. 3, 1917, authorized Dec. 20, 1921.

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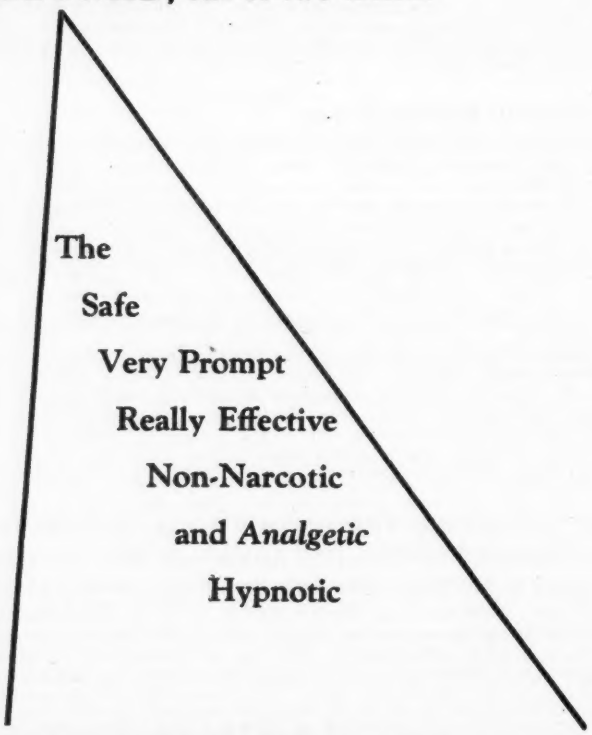

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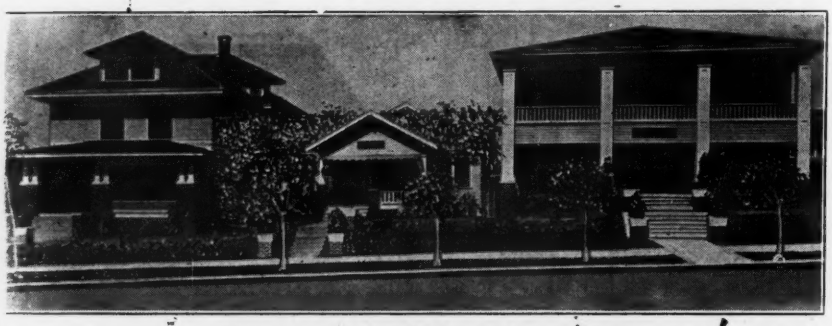

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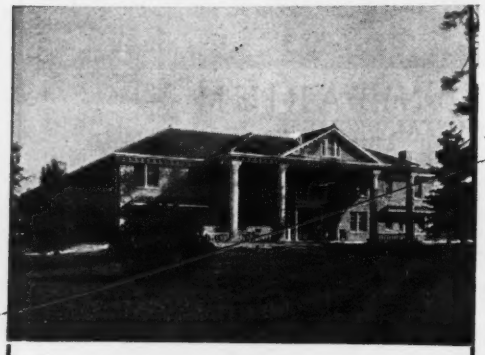

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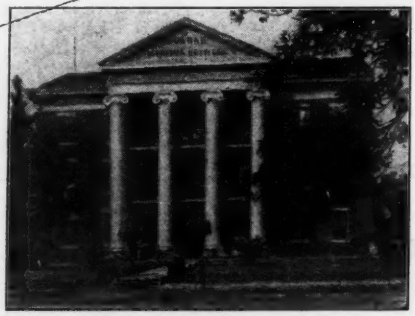

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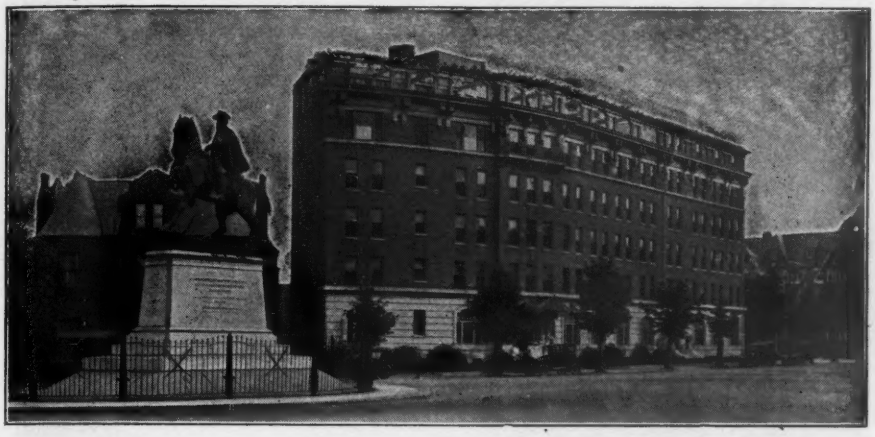

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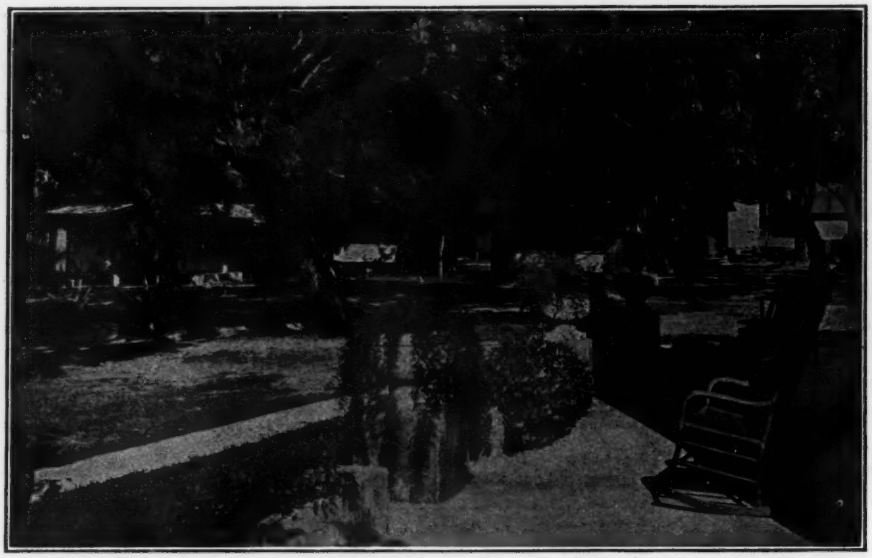

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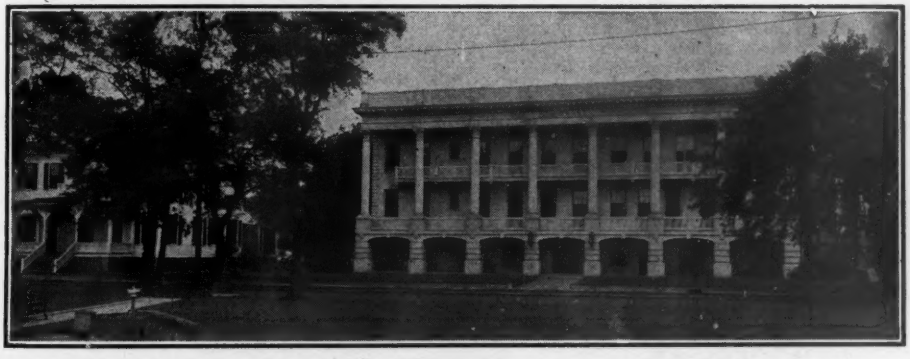

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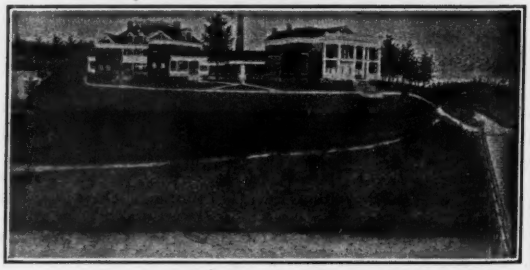

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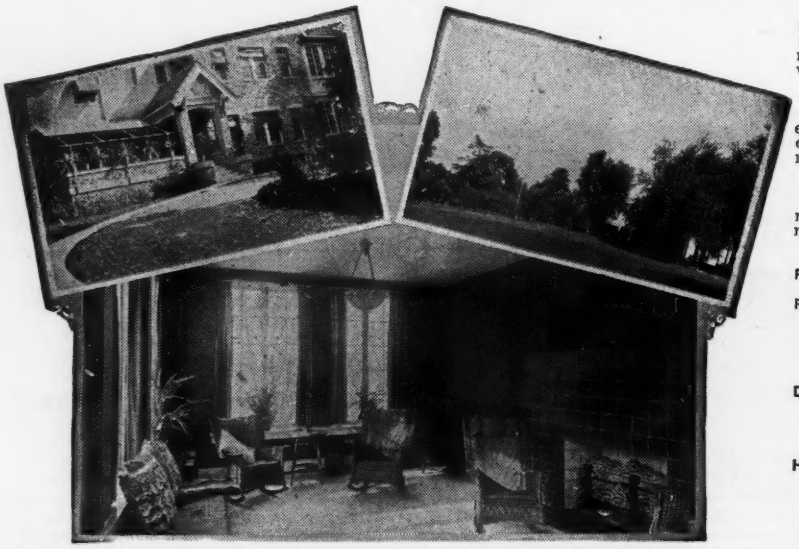

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Volume XX FEBRUARY 1927 Number 2

CRITICAL FACTORS IN THE SURGERY OF THE GALL BLADDER AND DUCTS*

By G. W. CRILE, M.D.,**
Cleveland, Ohio.

The sequence of events which follows extensive operations upon the gall bladder and ducts in cases which are bad risks differs only in degree from that which follows excision of the liver. There is an immediate and body-wide functional decline which, unless checked, leads inevitably to death. Because this sequence of events is so uniformly present, even after operations performed with the most perfect technic, it is obvious that one must look beyond the local region itself for the explanation. Two outstanding facts regarding the anatomical structure and relations of the liver point the way to a conception regarding its body-wide influence, which in turn indicates methods whereby this untoward sequence of events may be prevented, or at least minimized. These two anatomical facts are, first: its extensive nerve system supplies every minute bile duct, every blood vessel, every cell, with nerve fibers. Both the bile and the blood capillaries are surrounded by a network or dense mesh of nerve fibers; and as for the cells, in many cases, as Macallum and Berkley have shown, the terminal nerve fiber may be seen to extend within the substance of the cell itself. Second, the liver is almost entirely supplied by non-oxygenated blood, the individual liver cells receiving blood only from the terminal branches of the portal vein, for the hepatic artery supplies only the bile ducts, the walls of the blood vessels, and the capsule of the liver. Thus, in contrast with the cells of other organs and tissues, the interchange of the circulation in the liver cells is not between the arterial and the venous systems, but is between the portal and the biliary systems.

In this final observation may be found a key to the peculiar menace of any interference with the terminal biliary system, while in the abundant nerve supply may be found an interpretation of the peculiar menace of any extensive abdominal operation, and in fact of any body-wide disturbance. For it is obvious that any rough contact with the liver itself or with the bile ducts cannot fail to affect the nerve supply of both neighboring and distant organs, and that any interference with the biliary blood supply, on the other hand, cannot fail to affect the portal circulation. Thus it would appear that a system or series of vicious cycles is established by every disease process within the biliary system or within the liver, and by every contact with the biliary system or with the liver.

It seems strange that in the case of the liver the primary essential of optimum function of any organ, that is, the maintenance of the integrity of its nerve supply, has been little, if at all, regarded. The nerves of the liver are derived from the left vagus and from the sympathetic nervous system. The distribution of these two systems of nerves is too well known to need recapitulation, but their relation to the liver should be emphasized, since it explains the widespread visceral and general symptoms which follow operations which impinge upon this organ. It is obvious that any rough contact with the liver itself or with the bile ducts cannot fail to affect the nerve supply of neighboring organs, and since the disastrous effects upon the ducts and liver itself do not terminate with the manipulation, the effects upon neighboring organs and upon the whole body will continue for a more or less prolonged period following operation, or those effects may be sufficient to endanger life itself.

In this respect, the liver may well be compared with the medulla oblongata. The medulla could not be crudely sponged without widespread disastrous effects, nor should one suppose that the nerves supplying the common duct are one bit less sensitive than those which supply the

*Read in Section on Surgery, Southern Medical Association, Twentieth Annual Meeting, Atlanta, Georgia, November 15-18, 1926.

**Cleveland Clinic.

cornea, for example. One would not attempt to remove a speck of dust from the cornea with sandpaper. The approach to that exquisitely sensitive structure is made with exquisite care. The approach to the exquisitely sensitive liver structure should be made with equal delicacy.

We have indicated above that the effects upon other organs of any encroachment upon the nerve endings of the liver are not only immediate but lasting. The following interrelations of the function of the liver with the functions of other organs has now been established: the organism as a whole loses its power of oxidation in the absence of the liver. Depression of liver function depresses the activity of the adrenal glands; depression of liver function depresses brain function. The liver, therefore, is essential to the function of the organism as a whole. The liver invariably responds to every variation in the activity of the organism, that is, it has been proved by laboratory experimentation that its histological structure, its capacity, its temperature and its conductivity are altered by the injection of adrenalin, in anesthesia, in convulsions caused by strychnin, in muscular activity, etc. The liver is as responsive and as sensitive as is the brain. It works when, and with the same intensity as the brain works and, therefore, one may readily understand why and how operations upon the common duct may have the same immediate and remote effects as operations upon the base of the brain. In operations upon the common duct, therefore, it must be remembered primarily that the sympathetic nerves in the walls of the duct and in the walls of the blood vessels which supply the ducts may easily be disturbed by manipulations, by edema, by sudden alterations in the pressure of bile, the effect of the latter reaching far back within the liver, within which the back pressure of the bile has a far-reaching effect. It is well known, as has been stated above, that even if the recurrent nerves are not touched by the surgeon in the course of a thyroidectomy their function may be disturbed or suppressed for many days by edema, the presence of scar tissue, etc. The same may happen in the course of an operation for the removal of a stone in the common duct, for, as we have emphasized above, the sympathetic and vagus nerve fibers in this region are supposed to be as sensitive as those in the region of the thyroid gland.

This delicate network of nerves may be spared injury, and the function of the liver and consequently of the rest of the organism may be conserved, by providing a reasonably accessible and well exposed field by means of a long incision and by wide regional anesthesia which will give complete muscular relaxation. If complete muscular relaxation cannot be assured by the regional block, then ether may be added as required. But the *sine qua non* for successful surgery of the common duct is an ample, clearly lighted field. The second requirement is proper dealing with the adhesions which are almost invariably present in such cases. If the adhesions are separated by gauze or by blunt instruments or by tearing them apart, the nerve endings will justly express their resentment of such treatment by the production of shock; and hemorrhage will add to the disastrous results; whereas, if the adhesions are divided at the white, bloodless line of cleavage within which there are few, if any, nerve endings, by a feather edge dissection with a sharp knife, whereby a clear innocuous field can be carried progressively forward until the gall bladder and the ducts lie unstained and uninjured under the eye of the surgeon, no shock or hemorrhage will be produced.

In most instances the surgeon can see clearly whether or not the common duct is dilated. If it is not dilated, the diagnosis of common duct stones is probably wrong. If it is dilated, then it should be opened and explored for stones. If the duct is of a normal size, and if there have been neither chills, nor fever, nor jaundice, then even if there are stones in the gall bladder there is no indication for opening or exploring the common duct. To explore the common duct in such a case is bad practice, because not only will no benefit result from it but much harm may be done. In fact, the patient may even pay with his life for the dull logic of a meddlesome surgeon, especially since the operator who is so illogical as to think he must explore the duct when there is no definite indication therefor will probably not have had a great deal of surgical experience. It should also be remembered that it is far more difficult to explore a common duct of normal size than a dilated common duct, since the latter gives ample space for a sure incision, for easy exploration, for ready closure by suture; or, if it cannot be closed by suture, its enlarged caliber gives assurance against cicatricial stricture as the result of drainage and operative damage. If there is no apparent indication for opening the common duct, however, it should be critically explored from one end to the other by light but sufficient pressure between the thumb and finger.

In the case of an obstructed common duct and the resultant back pressure of bile, the

disastrous results of a sudden release of the bile should be remembered, these results being comparable to the effect of a too sudden release of urinary back pressure upon kidney function. The function of the bile with its high alkalinity, when its pressure is maintained at a normal degree, is to maintain the alkalinity of the liver cells. Drainage of the common duct under any circumstances reduces this pressure to zero; and if there is a sudden release after a high back pressure due to obstruction, the effect is the same as that produced by the sudden breaking of a dam, that is, the pressure is temporarily reduced far below the normal level. It should be borne in mind, also, in connection with the question of drainage that faulty drainage may produce a well instead of a stream. Too much fluid may accumulate before it escapes, with immediate resultant functional disturbance, and the more remote result of adhesions which in turn interfere with liver function and consequently with general organic function. This damage is avoided or largely eliminated by employing gravity drainage through Morrison's pouch. Owing to the position of this pouch, the accumulation of fluids will be avoided, and the resultant adhesions will not be at such vulnerable points as those impinged upon by an anterior drain. When this method of drainage is employed the primary abdominal incision can be closed at once.

Moynihan has called attention to the importance of a thorough knowledge of abnormalities in the anatomy of the bile tract. Because of his appreciation of the ill results which follow injuries to the bile ducts in the course of an operation on the gall bladder, or the overlooking of stone within the duct which is not in its classical position, Flint made for him an elaborate investigation of the abnormalities in the anatomy of the bile tract, and of the bile duct in particular, and a study of his findings as reported in the *British Medical Journal* and in Moynihan's recent monograph on abdominal operations is well worth while.

In view of what we have stated regarding the widespread effects of impaired liver function, it is hardly necessary to emphasize the importance of the employment of all the measures at our command for the conservation and restoration of the organism. However, for the sake of emphasis it may be worth while to note in particular the need for testing and, if necessary, restoring the clotting time, for establishing a normal water balance, and for the use of alkalinizing measures. Even with the application of every restorative measure at our command, however, occasionally liver function fails after operation, with the resultant decline of every function, both mental and physical.

We have already referred above to the extent to which the interrelation of the liver with bodily function as a whole has been established by the application of methods of physical measurement, of temperature, capacity and conductivity. It remains to mention one important fact which has been established by these researches, namely, the relation of the thermogenic function of the liver to the maintenance of the temperature of the organism. By experimental researches in the biophysical laboratories of the Cleveland Clinic it has been found that the introduction of heat within the abdomen causes an immediate rise, not only in the temperature of the liver, but also in the temperature of the brain, the rise in the temperature of the brain occurring synchronously with the change in the temperature of the liver. It would follow from this observation that the application of heat to the liver should in a large part counteract the ill effects of operations upon the liver and bile ducts. As a result of our interpretation of this experimental fact, we have been applying heat to the liver by means of diathermy, which we have found to be an ideal method of holding the temperature of the liver at a normal level. One plate of the diathermy apparatus is placed on the lower chest on one side and the other is brought opposite the dome of the liver. The current can thus be continually applied during the operation and the temperature of the liver and of the abdominal viscera can be maintained at or above the normal throughout the operation, regardless of the exposure of the intestines; moreover, the application of the diathermy current during the immediate post-operative hours is of great aid in carrying the patient through that critical period.

Finally, and in briefest summary, operations upon the common duct can be most efficiently performed with the greatest advantage to the patient by a sufficient appreciation of the following points: (1) explicit knowledge of the nerve supply of the ducts and of the liver; (2) of the relation of the liver to the organism as a whole; and (3) of the value of the application of such measures during, before and after the operation as are suggested by the knowledge of these two fundamental factors, which are of prime importance in their influence upon the immediate and remote results of operations upon this important part of the biliary system.

DISCUSSION (Abstract)

Dr. J. Shelton Horsley, Richmond, Va.—Modern surgery is under the greatest debt of gratitude to Dr. Crile, not so much for the individual points of technic he describes and practices as for the principles he has established. Few of us have the gentle, artistic touch he has, but all of us can take the general principles that he lays down and adapt them to our own particular idiosyncrasies and to the case in point. He has established correct principles for operations in goiter cases.

The big, husky patient with plenty of resistance will stand almost any kind of surgery, but it is the very sick patient who needs the greatest care. The question of the preservation of resistance in the very ill patients is vital. And if a method works well for weak patients, it is good sense not to waste the vitality of the patients in whom we could be more prodigal of it. The structure of the liver, its vital function and its important nerve supply should in themselves cause us to pause when we begin to pack the liver off with gauze and expose the viscera unnecessarily. If we gained nothing else from Dr. Crile's paper, that warning would be well worth while. The details of drainage are also interesting and correspond to the physical and anatomical laws he has given.

In our ideas of the function of the liver we change with the fashions that are said to change every seven years. Medical ideas also change to some extent and to the old practitioners the liver was the all-important organ. They gave medicine to "jog the liver" and increase its action. Then it was found that giving calomel did not increase the biliary flow and nothing did, excepting possibly the bile salts, and we began rather to ignore the liver and belittle its importance. Probably some of us can live with less liver and less brains than others.

We have reserve power in the liver which is not appreciated. If we gradually decreased its function we might live on for several years. It is known that if we gradually decrease the function of the kidneys an animal can live on one-eighth, or certainly one-fourth of what is considered a normal amount of kidney structure; and if the inroad into the vital structure of the liver is gradual the patient more readily adjusts himself to it. We need not think that the fact that a patient has suffered these traumatic insults and has not succumbed, disproves Dr. Crile's theory.

Let me call attention again to the great importance of keeping all the vitality, particularly in the very old patient. You will remember that Edgar Allen Poe made a very clear illustration of how he wrote his noted poem, "The Raven." He analyzed it and told how he wrote each line and made it seem so simple that it appeared that anyone could write a similar one, but he left out his own genius. We cannot all follow the technic of Dr. Crile for we have not his genius, but if we will follow the principles he has laid down our patients will greatly benefit thereby.

Dr. Dean Lewis, Baltimore, Md.—Judging from this paper and the discussions which have occurred frequently during the past year, one is justified in saying that all the problems in connection with surgery of the bile tracts have not been definitely settled. Surgery of whatever type often leaves residual changes which cannot be corrected. If we were built on the plan of an automobile and a new part could be substituted when one has been badly damaged or worn out, our problems would be simple. Often when the best surgery has been done there remain residual phenomena, because there is a change in some finely correlated or well adjusted physiological mechanism.

Dr. Crile has brought out some very important points in the handling of the bad surgical risks in diseases of the bile passage. Every time that a badly jaundiced patient is operated upon and something goes wrong, I am quite sure that the course would have been changed if some other line of procedure had been followed. The liver is badly damaged in most of these cases, and a decompression frequently has to be resorted to, if the chances of recovery are to be greatly enhanced. Bile should be regarded as of considerable physiological importance, for patients certainly suffer as the result of long continued external drainage. In those cases in which a stone is left in the common duct the convalescence is often delayed and these patients not infrequently do badly.

I have often had the experience that hemorrhage, which may prove fatal, has occurred on the tenth day or later when the jaundice is subsiding.

Dr. Crile's main contention seems to be that the liver should be stimulated in these cases, but the question naturally arises as to whether it would not be better to keep at rest a diseased or damaged organ until it has had time and opportunity to recover.

Dr. E. Denegre Martin, New Orleans, La.—Dr. Crile has described his method of removing the gall bladder, and his explanation of the use of diathermy and the possible cause of shock from injury to nerve centers. I have never been able to remove any but the nearly normal gall bladder by this technic. The condition that concerns me most is the truly pathological gall bladder, especially if there is empyema. I have found that when these are removed, the mortality is high, either from infection or hemorrhage, and I now use the following technic: after walling off the stomach and intestines, the gall bladder is emptied and split from fundus to apex. If the gall bladder is distended, the redundant wall is removed, all bleeding points are ligated, the remaining mucosa is swabbed with iodin and a cigar drain is inserted. The inner tube is placed in the duct and the whole held *in situ* with catgut sutures. I have operated upon fourteen such cases in the past eight years, and all are still alive, whereas I am confident a cholecystectomy would have resulted fatally. The advantages of this procedure are, lessening of shock, control of hemorrhage and simplicity of technic. It can be done by any surgeon in any class in a very short time.

Dr. Crile (closing).—Skill alone does not count in the presence of a difficult situation. The only thing that counts is that ordinary skill be based upon and guarded by good sound principles.

SURGERY OF THE GALL BLADDER*

By IRVIN ABELL, M.D.,
Louisville, Ky.

The importance of the gall bladder has been emphasized in recent years both to the surgeon and to the general practitioner. Some of my friends who do a general practice have estimated that the gall bladder is responsible for at least 25 per cent of the dyspepsias for which patients consult them. When we consider that the stomach, duodenum, pancreas and appendix are practically the only other abdominal causes of dyspepsia, this at once focuses our attention on the gall bladder as an extremely important organ for study.

May I for a moment, before taking up the surgical aspects, review some of the facts with which we are familiar? First, as to the function of the gall bladder, there are two of which we are positive, although many have been ascribed to it. One is that it is a tension bag on the biliary system, the other that it is a storage place for bile due to its ability to concentrate the latter. These functions and any others which have been ascribed to it may readily be replaced or assumed by other organs, as is demonstrated by the long series of surgical removals as well as destruction of gall bladders by disease. Secondly, all diseases of the gall bladder, except malignancy, are due to infection. This statement is true of neoplastic diseases other than malignancy. In a series of approximately five hundred cholecystectomies, carefully studied microscopically, we were able to find eleven cases of adenomata and papillomata. These patients all gave a history of chronic cholecystitis, and each and every one of these gall bladders showed upon microscopic study the evidence of a long standing inflammatory process.

It is true that infections within the gall bladder may be ephemeral. They may subside and leave a gall bladder whose function has not been impaired. It is true that appropriate treatment in the early stages will cause many of these to subside before the advent of symptoms indicative of progressive organic change.

I will ask Dr. Aiken to read the history of the two patients I am to present to you, as they illustrate very beautifully the acute gall bladder.

*Clinic, General Clinic Session, Southern Medical Association, Twentieth Annual Meeting, Atlanta, Georgia, November 15-18, 1926.

Dr. Aiken.—This first patient, Mr. G., is 37 years old, a butcher by occupation. He was admitted to the hospital on October 14, complaining of pain in the right upper quadrant. The trouble began six days before, with paroxysms of pain, sharp in character, in the right upper quadrant, which radiated to the right scapular region. He did not go to bed until the day he entered the hospital, when the pain seemed to be worse. During the attacks the patient would sweat profusely and become very weak. There has been no nausea or vomiting, but he has lost his appetite. He gives a history of a similar attack two years previously, and has had several spells since that time. He also gives a history of chronic constipation and indigestion for the preceding twelve years. There was some jaundice about six weeks ago, but there have been no clay-colored stools so far as is known.

Physical examination showed slight muscular rigidity of the right upper abdomen, with marked tenderness over this region. His temperature was 100.5° F., pulse 92, respiration 22. The blood count on several occasions was as follows:

	10-14	10-16	10-19	10-20	10-23
W. B. C.	16,700	13,000	14,800	15,900	18,800
Polys.	86%	84%	79%	86%	78%
S. L.	11	10	18	16	18
L. L.	2	4	3	6	4
T.	1	2	0	2	0

Urinalysis was essentially negative, as was the Wassermann reaction.

The patient was operated upon on October 26, 1926, under local anesthesia. The gall bladder was found to be gangrenous and very friable, with a perforation in its fundus leading to a subcholecystic abscess. It contained a large amount of creamy pus, and there was a stone the size of a marble in the cystic duct which we were unable to remove.

The second patient, Mr. A., is 47, a plumber by occupation. He was admitted to the hospital on October 28, complaining of pain in the right upper abdomen. He stated that the attack began eleven days before, with a severe pain in the upper abdomen, which was followed by nausea and vomiting. There was no blood in the vomitus. The pain was paroxysmal in character and did not radiate. There was no previous history of indigestion or eructation of gas. The bowels have moved freely with purgation, but he has had no appetite since this attack began. His past history is negative except for an attack of jaundice seven years ago, which lasted about one week and was not accompanied by pain. His general health has always been very good, except for slight attacks of pain in the right lower quadrant, which did not cause him to go to bed.

Physical examination disclosed a rather obese abdominal wall which was soft. There were no muscular rigidity, no palpable masses and no tenderness, except to deep pressure in the right upper quadrant just beneath the ribs. His temperature was 98° F., pulse 110, respiration 24. The blood count on several occasions was as follows:

	10-28	10-29	11-3	11-9
W. B. C.	13,700	7,500	9,400	10,600
Polys.	79%	67%	69%	62%
S. L.	15	23	26	37
L. L.	0	6	5	0
T.	3	4	0	1

R. B. C., 3,980,000; Hb., 85%.

The urinalysis was essentially negative, as was the Wassermann reaction.

These two cases present several interesting phases of the acute gall bladder. First, only one gives a history of digestive disturbance and colics previous to the onset of his acute illness. This one, we know, has had disease in his gall bladder over a long period of time, for at operation a stone was found in the gall bladder. We know that stones are practically always the result of long-continued, mild, low-grade infection, but never the result of an acute gall bladder condition. In many instances, such infections subside, become quiescent, or entirely disappear, leaving in the gall bladder a stone or stones which may go for several years without causing the patient any serious trouble and later, as in this instance, either by blocking drainage of the gall bladder, by activating the old infection or by inciting a new one, give rise to an acute process.

This also illustrates the fact that comparatively few of the gall bladders which are diseased develop symptoms which urgently demand immediate operation. Acute gangrenous cholecystitis, perforation or rupture of the gall bladder, and hepatic and subhepatic abscesses may be considered in the light of emergencies, but practically all other instances give time for thorough study of the gall bladder and of the patient before operation is undertaken.

This first patient, the one with the perforation of the gall bladder, illustrates that in the emergencies connected with the gall bladder the important consideration is the saving of life and not the cure of his disease. The cure of his disease would mean the removal of certain diseased tissue. The pathological ideal in such a case must be subordinated to the ideal of saving life. The least possible operative trauma should be inflicted. Excellent judgment was shown in this case in attempting the operation under local anesthesia, in doing as little trauma as possible in opening the abscess which had resulted, and securing drainage from that and drainage from the gall bladder as well. It leaves a condition which will require further surgery, for the patient's condition was such that it was deemed unwise to attempt removal at that time. Successful surgery, particularly in the acute disasters, depends more upon the judgment of the operator than upon the extent of his mechanical skill, for the danger of doing too much is out of all proportion to the good that may be attained.

The second patient illustrates the interesting feature that he had no history of previous digestive disturbance. He had one attack of jaundice seven years previously, but no further trouble until the acute attack which originated three weeks ago. There was nothing in this to demand immediate operation. The physicians on the staff of the Grady Hospital have shown excellent judgment in tiding this patient through his acute attacks, so that when surgery is undertaken a curative operation may be performed.

What do we mean by curative operation? As stated previously, the ephemeral infection may disappear. It frequently does, but the reverse is equally true, that an infection which spreads to the bile passages involves the liver tissue itself, often involving the pancreas, so that instead of a localization in the organ which is readily attacked by surgery we have it spreading to organs, the surgical removal of which is entirely impossible.

During the last year, following the work of Heyd, of New York, we have been routinely removing a small bit of liver tissue for microscopic study in cases presenting marked chronicity. In no single instance has the microscope failed to reveal an intralobular hepatitis, associated in some instances with fatty degeneration of the liver cells. If we have a comprehensive view of gall bladder disease, we realize that we are dealing with one which includes the duodenum, the pancreas, the bile passages, and the liver, and we have a more complete idea of the pathological conditions with which we must deal, and consequently a better idea of the indications, as well as the limitations of surgery. It also gives us a better idea of why both medical and surgical treatment in diseases of the gall bladder and biliary tract sometimes are associated with failure in affording relief of symptoms. While it is impossible to state that each of the classes represents different types of pathology, it is true that gall bladder patients can be divided into practically three groups. In one there is nothing to indicate the presence of disease except the digestive disturbance, the sense of fullness after eating, the belching of gas, and the discomfort. In the second group the symptoms are directly referable to the gall bladder, either with or without digestive disturbance; and in a third group in addition to these symptoms there are associated evidences of pancreatic infection, with consequent deficiency of pancreatic secretion and serious undermining of the patient's health.

I think perhaps the rest of my time can best be taken up in discussing the diagnosis of gall

bladder disease, the preparation of patients for operation, and in mentioning some of the causes for failure in the treatment of gall bladder lesions by surgical means.

While all of the laboratory methods are of great assistance, the essential thing must, after all, come back to the study of the patient's history. In the group of cases in which the patients complain solely of dyspepsia, the laboratory is essential in differentiating between functional and organic dyspepsia. The x-ray is valuable from several viewpoints: first, in that it demonstrates the presence or absence of ulcer in the gastric or duodenal regions; secondly, when it shows a lagging of the meal in the second portion of the duodenum due to extrinsic cause, adhesions dependent upon cholecystitis are frequently present; thirdly, it shows in many cases the presence of stones. Unfortunately, the technic of reflecting concretions has not been perfected sufficiently to be regarded as a reliable test of their presence. If a skiagram shows them we know they are there, but the absence of such shadows does not necessarily imply the absence of stones. Lastly, the excellent method of cholecystography which has been brought out by Evarts Graham, of St. Louis, is of much assistance. While it is by no means an infallible guide, it is a tremendously valuable help, particularly in those cases of dyspepsia without symptoms directly referable to the gall bladder.

The second clinical group in which we have symptoms referable to the gall bladder itself, in addition to the digestive disturbance, is the one in which the history and clinical findings will, in the vast majority of instances, suffice for diagnosis. The localization of the pain, the colics that are more or less typical, enlargement of the gall bladder, such as is present in this second case, all point distinctly to the location of disease. It then becomes merely a question of what type of surgery is to be carried out and the time for doing it.

In the first group, in which we have only the digestive disturbance as evidence of a gall bladder disease, unless one can demonstrate that the disease is of sufficiently organic extent to demand surgical treatment, the patient should be given the benefit of medical means. In many instances he is relieved and made comfortable without the necessity or advisability of resorting to surgery.

In the second group, where the gall bladder wall is thickened with resultant impairment of contractility, where there is loss of ability to concentrate bile and pour it into the digestive tract, operation is necessary for symptomatic cure.

In connection with the second group and the third where, in addition to the gall bladder disease, we are certain of coincident liver and pancreatic involvement, the importance of preoperative study and observation cannot be stressed too strongly. The various dyes which have been introduced for the study of liver function require elaborate chemical tests and have not been demonstrated to be absolutely worth while. We have depended upon the icterus index and the van den Bergh text, both of which are of very definite importance. The icterus index will show the presence of bile in the blood long before discoloration of the skin becomes evident to the naked eye; consequently we can be positive of liver insufficiency long before the examination of the skin reveals it. The use of the van den Bergh test will show whether it is of a hematogenous or obstructive type. By careful study and correlation of these methods conjoined with the clinical findings one can form a good idea of the liver function and general resistance, and with such information at hand a proper medical and surgical management can be carried out. The methods of preparation vary but briefly: alkalinization, rest, the use of carbohydrates and glucose and, where marked jaundice or lowered clotting time exists, the intravenous administration of calcium chlorid, preferably given on three consecutive days before operation, or, what is better, the transfusion of whole blood the day preceding and the morning of the operation, are tremendously helpful.

By carrying out such a regime the mortality can be greatly reduced. The day of discussion as to whether we shall do a cholecystectomy or a cholecystotomy is probably past. Most of us feel that if the gall bladder has sufficient disease to impair seriously its function, and if the remainder of the biliary tract permits, its removal is indicated. Many have lost sight of the fact that the disease is not limited to the gall bladder alone. The appendix rarely produces contiguous lesions which prohibit its removal, but a gall bladder with a coincident involvement of the pancreas, of the duodenum, and of the liver and ducts, as is frequently observed, cannot always be removed with assurance of safety. The ideal to be attained is the removal of the pathological tissue, and this cannot be done unless it is limited to the gall blad-

der alone. In the third group, in which the disease is not limited to the gall bladder, that ideal cannot be carried out. The ablation of pathological tissue, removal of stones, provision of drainage and elimination of obstruction are the indications the surgeon must have in mind when he attempts gall bladder surgery.

Just for a moment I shall speak of one cause of death in gall bladder surgery. Leaving out the infection of the peritoneum and cardiorenal deficiency, the question of infection of the liver, hepatitis, is the most important. The peculiar type of death which one observes in these cases, high temperature with a pulse of 140 to 150, disturbance of the intellect, coma, and ultimately the lethal end, points conclusively to an intoxication which, inferentially, is hepatic in origin. The use of ether, a lipoid solvent, probably has something to do with liberating these toxins. Since we have stopped using ether, such symptoms have been seen less frequently. Personally I believe that all operations on the gall bladder, especially if the disease has persisted for some time, should be done under local anesthesia, as was done in the first case presented today, or under gas or ethylene anesthesia.

May I conclude with some of the causes of failure to relieve patients by surgery? The retention of crippled, disabled gall bladders is a potent one; the pathological changes sequential to long continued infection in liver, ducts and pancreas a frequent one; while incomplete operations must always be taken into account. It is not always possible to remove all stones. Many of them wander into other portions of the biliary tract, often extending into the hepatic ducts, while there may be stones within the liver itself, few and large, or small and multitudinous. In the latter contingency it is not always possible to be sure that one has removed every stone. Cases are on record, one mentioned by Rallston in which eight thousand stones were removed at one time. It is impossible to tell at subsequent operations whether the stones present are newly formed or left-overs. So, failure to remove all of the stones and all of the pathological tissue present, both of which are at times impossible on account of local conditions, is the greatest cause of failure to relieve symptoms. It is not logical to assume that drainage or removal of the gall bladder will in every instance cause a disappearance of the fibrous deposit within the pancreas or in the liver, or will cause a regeneration of the liver cells which have already deteriorated as the result of fatty degeneration, or from the pressure of intralobular fibrous tissue.

Experience has shown that with drainage operations approximately 70 per cent and with gall bladder removal operations approximately 90 per cent of patients are symptomatically cured, leaving in the one instance 30 per cent, and in the other 10 per cent of patients who continue to present varying disturbances of digestive function due to one of the aforementioned causes.

RELATION OF SYPHILIS TO ANEURYSMS*†

Observations on Forty-Five Aneurysms In One Thousand Five Hundred and Ninety-Five Autopsies

By Stuart Graves, M.D.,
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The relation of syphilis to aneurysms in any fairly large series of cases in which the former is checked by reliable Wassermann tests, clinical histories and anatomical evidence, and the latter by complete post-mortem examinations, should be of considerable value for clinical consideration. In the Louisville City Hospital over a period of ten years we have made such a study. Admissions show about 45 per cent colored people and 55 per cent white people. To state conclusions briefly at the beginning: in one thousand five hundred and ninety-five autopsies there have been found forty-five aneurysms (2.8 per cent); 95.5 per cent were in negroes and 4.5 per cent in whites; the Wassermann reaction was three or four plus in 75.5 per cent of the cases. The negative Wassermann reactions were usually found in cases of aneurysm which gave historical or other anatomical evidence of syphilis, and we are inclined to agree with MacCallum, who states in his "Textbook on Pathology" that:

> "Our experience, which includes the study of an unusually large number of aneurysms, tends to impress us with the conviction that all are due to syphilis."

This study has included not only the relation of syphilis to aneurysms but also the incidence, character and distribution of the aneurysms because of their clinical interest. Some of the

*Read by title, Section on Pathology, Southern Medical Association, Twentieth Annual Meeting, Atlanta, Georgia, November 15-18, 1926.

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more complicated and unusual cases are added briefly because of their relation to diagnosis as well as to etiology. It is well to begin with a definition and classification of aneurysms.

An aneurysm is a permanent pathological dilatation of a blood vessel, involving one or more coats of the vessel. Aneurysms are classified primarily as true aneurysms and false aneurysms. Most aneurysms fall within these two classes. There are also classified arteriovenous aneurysms and special forms, such as parasitic or mycotic, but these are so rare that they are hardly considered within the scope of this paper. The true and false aneurysms are further divided into saccular, which are by far the most numerous, fusiform and dissecting. As to distribution, aneurysms may involve any blood vessel in the body and may be of any type in any vessel, but in practice the saccular variety greatly predominates and is found most commonly in the aorta above the diaphragm. In our series the aneurysms were found in the arch in 49 per cent in the descending thoracic aorta in 24 per cent and in the abdominal aorta in 15.5 per cent.

In connection with the distribution of aneurysms between male and female, it is interesting to note that this series shows that they were found in the male more than twice as often as in the female.

Saccular aneurysms were found in 94 per cent of the series, single in 77 per cent and multiple in 17 per cent. Every true or false aneurysm, eliminating only the arteriovenous, parasitic or mycotic, must begin primarily as a localized stretching and dilatation of the wall of the vessel, due to damage in the wall itself. The injurious agent probably includes the presence of Spirocheta pallida, or destruction due to loss of nutrition locally through the shutting off of blood supply to that part as the result of an obliterative endarteritis of the nourishing vessels caused by Spirocheta pallida. By its very nature it lends itself to slow and permanent damage, gradual dilatation and somewhat simultaneous, but finally successive involvement of all of the different coats of the vessel. A true aneurysm is defined as one in which at least one of the coats of the artery is intact and forms a part of the wall of the sac. Naturally the adventitia is the last portion of the arterial wall to give way, because the destruction progresses from the lumen outward. The opening from the artery into the aneurysmal sac may be linear, oval or round, and usually takes one of the last two shapes. The gradually enlarging sac receives support from the surrounding structures and against its sides are laid down lamellated clots which tend to undergo organization. If the dilatation is very slow, the endothelial lining tends to spread from the intima of the artery over the edges of the aneurysmal opening onto and over the inner surface of the sac, and may in time completely line the sac, but as a rule it spreads only a limited distance from the aneurysmal opening. If the blood pressure is not too high and the wall of the sac is sufficiently supported, such an aneurysm may exist for a long period of time without complications; and such aneurysms, if favorably located, may lend themselves to surgical intervention. On the contrary, if the blood pressure is high, and if the sac gradually gives way, it may eventually rupture into a cavity, producing fatal hemorrhage or death by interference with physiological function, or it may bore itself a path through solid bone, even to the extent of pointing beneath the skin and finally rupturing to the outside, or to the extent of destroying the bodies of vertebrae and impinging upon the spinal cord.

The eventual termination of aneurysms is interesting. In this series 46.6 per cent ruptured, most commonly into the pericardial cavity, almost as many times into the retroperitoneal structures, next most commonly into a pleural cavity and thereafter as shown in the accompanying table.

Before showing the lantern slides with some of the details discussed, I shall describe a few of the individual cases.

A negro man, 45 years old (A-16-106), had a four-plus Wassermann. He was admitted to the hospital with a provisional diagnosis of pneumonia, but in such a condition that a history was unobtainable, and he died in a few hours. Physical examination showed cyanosis, air hunger, apparent consolidation of both lungs; cold, clammy sweat, pulse 100, respirations 44, and temperature 98°. The autopsy showed an abdominal aneurysm which had ruptured into the retroperitoneal tissues. There were about 400 c.c. of thin, light red blood and several small, dark red blood clots in the peritoneal cavity. After removal of this fluid and clot, there was found an extensive, bluish red, bulging, retroperitoneal mass of jelly-like consistency situated on the left postero-lateral surface of the peritoneal cavity anterior to the lower border of the left kidney, quadratus lumborum and iliopsoas muscles. It was limited below by the left lateral surface of the bladder, above by the splenic flexure of the colon, and medially by a line drawn from the left external inguinal ring to the lower pole of the spleen. Overlying the most prominent portion of the mass was the descending and sigmoid colon, which had been displaced forward and inward. The contents of the mass were found to be composed of dark red, clotted blood. The

appendix was retrocecal, pointed upward and outward, and was bound down by firm adhesions, measuring 9 cm. in length. Under the description of the aorta is the following record:

"There is a bilateral cone-shaped bulging of the aorta beginning on a level with the lower border of the eleventh dorsal vertebra (8 cm. above the celiac axis). The widest portion of the bulging, which is situated opposite the first lumbar vertebra, measures 8 cm. On opening the aorta there is found on its posterior wall an oval perforation with rounded edges beginning on a level with the lower border of the celiac axis and extending upward for 6.6 cm., measuring 1.7 cm. in greatest width. The opening leads into a sac which is referred to in the above as the cone-shaped bulging. On dissection, this sac is found to be filled with dark red, friable, lamellated, clotted material. After removing the clotted material, the posterior wall of the sac is found to be absent, thus allowing the twelfth dorsal and first lumbar vertebrae to become intimately connected with the contents of the sac. At the left lower border of the sac, limited anteriorly, medially and laterally by the left medial arcuate ligament and posteriorly by the psoas muscle, is an opening which communicates with the bluish red, retroperitoneal mass referred to under the peritoneal cavity. Aside from the perforation the intimal surface of the aorta presents numerous grayish yellow, elevated streaks and patches, the latter being more prominent near the aortic orifice.

"*Vertebrae.*—There is an erosion of the anterior one-third of the bodies of the twelfth dorsal and first lumbar vertebrae, the inter-vertebral disc standing out prominently and apparently little involved."

Another interesting case (A-17-10) is that of a male negro, 51 years old, who was in the Hospital only three days before his death. He was admitted with a provisional diagnosis of bronchial asthma. He had complained for several weeks of dyspnea which had gradually become so bad two days before admission that he was brought to the Hospital for treatment. In the complicated clinical picture appeared signs of laryngeal and pulmonary edema, alternating with spells of suspension of breathing, broken by violent spells of coughing, which kept the whole ward awake. The autopsy revealed a saccular aneurysm springing from the posterior wall of the arch, measuring 7 by 9 cm. in diameter and impinging 3 cm. above the bifurcation of the trachea, upon the trachea and pressing it backward and to the right so completely as practically to occlude it. Where it pressed most upon the trachea it was crossed posteriorly from right to left by the esophagus. In this case the post-mortem Wassermann was anticomplementary. No ante-mortem Wassermann was taken.

A male negro 48 years old (A-17-45), with a four-plus Wassermann, was in the Hospital twenty-seven days, during which time several members of the visiting and resident staff studied the case apparently very thoroughly. These studies are too lengthy for record in this paper, but the final diagnosis was carcinoma of the stomach. The description of the autopsy itself is also too lengthy to record here. It revealed a sacculated aneurysm of the arch of the aorta which gradually ruptured downward, the false aneurysm working its way toward the lower portion of the right pleural cavity. It produced a round mass 5 by 8 cm., which projected into the cavity about 4 cm. and ruptured at its summit through an orifice 2 cm. in diameter, which released about 500 c.c. of fluid blood into the right pleural cavity. There was no evidence of carcinoma.

In another male negro 50 years of age (A-17-71), with a four-plus Wassermann (post-mortem), the autopsy revealed an aneurysm of the aorta 2 cm. above the renal artery which had an aneurysmal opening from the aorta nearly 15 by 20 mm. in diameter, which had bored its way backward into the bodies of the adjoining vertebrae so that the distal wall of the sac was made up of eroded vertebrae roughened and spiculated. This autopsy was a coroner's case which had been sent in after death at a time when we were doing autopsies for the coroner to build up our pathological museum. Consequently there was no clinical history of his record in the Hospital, but death had resulted from chronic nephritis and sclerosis of the liver.

A similar case in a male negro about 45 years of age (A-18-20), also a coroner's case, admitted just before death with a final diagnosis of emphysema, revealed a sacculated aneurysm impinging upon and eroding the fourth, fifth and sixth dorsal vertebrae so that only a thin shell of the bone remained on the right side.

A veritable curiosity shop of pathology was presented in the post-mortem findings of a male negro 50 years of age (A-19-40), with a three-plus Wassermann. This case was studied at great length and the diagnosis of aneurysm made by clinical findings and by x-ray, the saccular aneurysm of the arch pressing upon the trachea, bronchi, esophagus and left recurrent laryngeal nerve.

Rupture of an aneurysm into the esophagus and stomach with fatal hemorrhage was found in a male negro 42 years of age (A-20-6), with a three-plus Wassermann, in whom aneurysm of the aorta was diagnosed ante-mortem. It is interesting to note that the rupture into the left bronchus had been diagnosed ante-mortem as the result of several hemorrhages from the mouth, the last one of bright red blood on the morning the patient died. The aneurysm had been located clinically as "of the transverse arch of the aorta, with probable rupture into the left bronchus." This was a fairly good clinical diagnosis, but the roundabout path of the hemorrhage had not been discerned and the autopsy revealed a saccular aneurysm of the descending portion of the aortic arch with perforation into the esophagus, hemorrhage into the esophagus and stomach and profuse erosion into the third, fourth and fifth thoracic vertebrae.

The inevitable result of a misspent life is incidentally recorded in the history of a female negro only 37 years old (A-21-78), who died of an abdominal aortic aneurysm which finally ruptured into the left pleural cavity. This unfortunate woman had married at the age of 16. Of three pregnancies the first one was terminated at two months, the second child lived to be eighteen months old and the third pregnancy resulted in a miscarriage at four months. There was a history of vaginal discharge accompanied by frequent burning urination over a period of two years. It is not necessary to relate the typical clinical history of subsequent salpingitis. At autopsy the left pleural cavity was found dilated with clotted blood and serum. In the diaphragm, 2 cm. lateral to the esophageal opening was an opening 2 cm. in diameter, leading into a cavity below the pleural covering of the diaphragm and connected with an aneurysmal sac springing from the aorta just below the diaphragm. This had evidently existed for a long time, as was shown by the erosion of the

Number autopsies Sept. 7, 1914, to June 30, 1925	1595	
Aneurysms	45	2.8%
Color:		
Black	43	95.6%
White	2	4.4%
Sex:		
Male	31	68.9%
Female	14	31.1%
Type:		
Saccular, Single	35	77.0%
Saccular, multiple	8	17.0%
Fusiform	1	2.2%
Dissecting	1	2.2%
Location:		
Arch	22	49.0%
Descending thoracic	11	24.0%
Abdominal	8	15.5%
Basilar	1	2.2%
Vertebral	1	2.2%
Right subclavian	1	2.2%
Left ventricular wall	1	2.2%
Wassermann:		
Positive	34	75.5%
Negative	7	15.5%
Anticomplementary	1	2.3%
Missing	3	6.7%
Rupture:		
Yes	21	46.6%
No	24	53.3%
Rupture Into		
Pericardial cavity	4	19.2%
Retroperitoneal	3	14.4%
Trachea	2	9.6%
Pleural cavity, right	2	9.6%
Pleural cavity, left	1	4.7%
Esophagus	2	9.6%
Stomach and esophagus	1	4.7%
Bronchus	1	4.7%
Bronchus and left lung	1	4.7%
Left lung	1	4.7%
Peritoneal cavity	1	4.7%
Brain	1	4.7%
Retroperitoneal through diaphragm into left pleural cavity	1	4.7%

aneurysm into the bodies of the eleventh and twelfth thoracic and first, second and third lumbar vertebrae. Incidentally there was found the leiomyomata of the uterus common to negroes, together with the usual chronic inflammatory condition of the adnexa.

Rupture of a saccular aneurysm of the aorta into the peritoneal cavity (A-21-83) was found in a male negro, 38 years old, with a three-plus Wassermann, who died shortly after admission to the Hospital before any history or physical examination could be obtained.

A rather unusual aneurysm is presented in a case of a male negro about 53 years of age with a four-plus Wassermann (A-24-9), who was admitted December 11, 1923, and died January 23, 1924. As long before as January, 1922, the patient had noticed a small swelling just above the center of the right clavicle. There was no pain at first, but after nearly a year a dull, indefinite pain was felt in his right arm. He continued to work for about two months, but had been unable to work or use his arm a great deal since. During the preceding month this mass had enlarged rapidly and pain in his right arm, shoulder and back had become severe. At the time of admission the patient presented a large, pulsating tumor anteriorly over his right upper chest, extending from the third rib on the right side backward to the upper border of the trapezius and from the upper portion of the sternum well up into the neck and laterally to the left mammary line. This case is of particular interest because of the slow development and because of the fact that the aneurysm was found in the right subclavian artery and had extended laterally between the right clavicle and the first rib to the upper margin of the second rib, upward about 8 cm. and to the left about 7 cm., lying along the right common carotid and in part under the trachea. The first rib on the right side was eroded to the marrow for 30 cm., the right sterno-clavicular junction was disrupted, and the articular surfaces of the sternum and clavicle were eroded. The third, fourth, fifth and sixth cervical vertebrae were so badly eroded that the spinal cord was exposed for a distance of 40 mm.

Perforation of the trachea was revealed at the autopsy of a male negro 53 years old (A-24-28) with a four-plus Wassermann. This was not diagnosed ante-mortem and the chief clinical impression had been bronchial asthma. His illness had covered a period of about two years. The first chief complaint had been shortness of breath which came in periodic attacks, at first rather infrequently, but coming on about every thirty minutes before the patient was admitted to the Hospital. He had been in such distress that an outside physician had been relieving the pain by hypodermics. Under the examination of the lungs, the following is recorded:

"Upon inspection, movements were equal, but limited. There seemed to be but little filling of the apices. On palpation, the above was verified. To percussion, the lungs were resonant throughout. At auscultation, the breath tone was clear without rales, but very little air entered the lungs. The typical rale of bronchial asthma was not heard."

The autopsy revealed an aneurysm of the ascending aorta and beginning arch with pressure atrophy and perforation of the trachea. This perforation had not progressed to the point of rupture and hemorrhage, but the mucous surface showed a reddened, roughened, ulcerated area about 4 mm. in diameter. A probe could be passed readily through the necrotic tissue beneath the aneurysmal clot through the ulcerated area of the trachea into the lumen of the trachea. The lungs showed congestion, edema and marked emphysema, with bullous sacs 2-5 mm. in diameter, especially in the bases.

Rupture into the pericardial cavity was found in a case of a female negro 52 years of age (A-24-67). Unfortunately a Wassermann was not taken before or after death in this case, but the microscopic description of the aorta showed a well marked round cell infiltration about the vessels in the adventitia. In the media were numerous small, patchy areas of scar tissue, infiltrated with cells of the lymphocyte series. A microscopical diagnosis of syphilitic aortitis was recorded. The description of the pericardial cavity and the aorta are as follows:

"The pericardial cavity was huge in size, extending 12 cm. to the left and 9 cm. to the right of the mid-line. Between the second and third ribs, just at the right of the sternum was a circular area 3 cm. in diameter in which the pericardium was firmly adherent to the thoracic wall. When the pericardium was opened, it was seen to contain several litres of blood-stained fluid and much blood clot. The ascending arch of the aorta was tremendously dilated with a saccular diverticulum extending anteriorly and to the right, in a situation corresponding to the area in which the pericardium was adherent to the thoracic wall. Careful exploration with a probe revealed a slit-like aperture leading directly from the saccular diverticulum into the pericardial cavity.

"The whole arch of the aorta was greatly dilated. It measured 9 cm. transversely when unopened. On its

Autopsy No.	Sex	Color	Type	Single or Multiple	Location	Rupture	Wassermann
14-47	M	B	Sac	Single	Arch	No	++++
15-10	F	B	Sac	Single	Arch	No	Neg.
15-12	F	B	Sac	Single	Arch	No	Neg.
15-13	F	B	Sac	Single	Arch	Yes	Neg.
15-23	M	B	Sac	Single	Arch	Yes	+++
15-92	M	B	Sac	Single	Abd.	Yes	+++
15-99	M	B	Sac	Single	Arch	Yes	None
15-127	F	B	Sac	Single	Abd.	Yes	++++
16-15	F	B	Sac	Single	Desc. Thor.	No	++++
16-71	F	B	Sac	Single	Desc. Thor.	No	Neg.
16-106	M	B	Sac	Single	Abd.	Yes	++++
16-113	M	B	Sac	Mul.	Arch	Yes	Neg.
16-134	M	B	Sac	Mul.	Abd.	Yes	++++
16-172	F	B	Sac	Mul.	Arch	No	++++
16-203	M	B	Sac	Single	Arch	No	++++
16-219	M	B	Sac	Mul.	Arch & Desc. Thor.	No	+++
17-10	M	B	Sac	Single	Arch	No	A. C.
17-45	M	B	Sac	Single	Abd. & Thor.	Yes	++++
17-71	M	B	Sac	Single	Abd.	No	++++
17-82	M	W	Sac	Single	Arch	No	++++
18-20	M	B	Sac	Single	Arch	No	?
19-40	M	B	Sac	Single	Arch	No	+++
20-6	M	B	Sac	Single	Desc. Thor.	Yes	+++
21-78	F	B	Sac	Single	Abd.	Yes	++++
21-83	M	B	Sac	Single	Desc. Thor.	Yes	+++
21-105	M	B	Sac	Single	Arch	No	+++
22-4	F	B	Sac	Single	Desc. Thor.	No	+++
22-61	F	B	Sac	Single	Arch	No	++++
22-87	F	B	Sac	Single	Abd.	Yes	+++
22-91	M	B	Sac	Single	Desc. Thor.	No	Neg.
22-116	M	W	Sac	Mul.	Left Vert. and Basilar	No	++++
22-119	M	B	Fusiform	Single	Desc. Thor.	No	++++
22-120	F	B	Dissecting	Single	Desc. Thor.	Yes	++++
23-1	M	B	Sac	Single	Arch	Yes	++++
23-76	M	B	Sac	Single	Arch	Yes	++++
23-98	M	B	Sac	Single	Basilar	Yes	++++
23-104	M	B	Sac	Single	Desc. Thor.	No	Neg.
23-118	M	B	Sac	Mul.	Desc. Thor.	Yes	++++
23-125	M	B	Sac	Single	Left Ventric. Wall	No	+++
23-164	M	B	Sac	Mul.	Arch and Desc. Thor.	No	++++
24-9	M	B	Sac	Single	Right Subclavian	No	++++
24-28	M	B	Sac	Single	Arch	Yes	++++
24-67	F	B	Sac	Mul.	Arch	Yes	
24-179	M	B	Sac	Single	Arch	Yes	++++
25-109	F	B	Sac	Single	Desc. Thor.	No	++++

right anterior border, about 7 cm. from the aortic valve, was an opening into the saccular diverticulum above described. The opening into this sac measured 5 cm. transversely and the sac itself was about the size of an apple. Immediately above it, but not involving the roots of the great vessels, was another similar but slightly larger saccular dilatation, quite distinct from the one described. Both of these sacs contained a considerable quantity of blood clot and fibrin-like material. The interior of the arch presented a typical hickory bark appearance, raised white plaques alternating with pitted scars, depressions and fissures."

Perforation of the left bronchus was found in a male negro 38 years old with a four-plus Wassermann (A-24-179). Aneurysm of the arch with chronic myocarditis and syphilis had been diagnosed in the case from careful study, the clinical notes recorded in the laboratory covering three pages of single-spaced typewritten data. On the last day the patient complained of much pain in the right side of the chest which the recorder said he was unable to account for, although he made the note, "Spitting up more blood today." At autopsy the entire pericardial cavity was found lying at the left of the mid-sternal line. The proximal portion of the aorta, 2 cm. from the aortic valve, showed beginning dilatation, going on into an elongated sac, 13 by 9 cm., which involved the entire arch of the aorta. The posterior wall of this sac had eroded through into the left bronchus at its junction with the trachea. The fourth dorsal vertebra was eroded at a point corresponding to the erosion through the bronchus.

The accompanying tables show the autopsy numbers by years, sex, color, type of aneurysm, whether single or multiple, where located, whether ruptured or not, and the Wassermann reaction in all except three cases; also percentage distribution as to race, sex, type, location, ruptured or not, into what ruptured if ruptured, and Wassermann reaction.

DETERMINATION OF RELAPSE IN AMEBIC INFECTIONS*

By F. M. Johns, M.D.,
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While engaged in an intensive study of the treatment of amebic dysentery and the eradication of infection in chronic cyst carriers pursuant to an investigation of the therapeutic effect of stovarsol,[1] I have been particularly interested in the means of determining a cure or

*Read in Section on Pathology, Southern Medical Association, Twentieth Annual Meeting, Atlanta, Georgia, November 15-18, 1926.

in anticipating a clinical relapse. I will not give any lengthy compilation of figures, but will attempt to convey the impressions I have obtained from a study of the entire series after following a number of patients for a period of many months.

By amebic infection is meant the active reproduction of pathogenic amebas within the body, and I desire to limit my discussion to the commonly accepted pathogen *Endameba dysenteriae*. This ameba, we believe, can reproduce only vegetatively within the tissues of the host, and particularly in the submucosa of the big intestine or in abscess cavities within the liver.

Treatment of a patient harboring an active amebic infection with any of the well recognized drugs such as ipecac or its derivatives, stovarsol or yatren, quickly reduces the actual numbers of protozoa present, the visible lesions in the rectum and lower sigmoid apparently heal, small multiple liver abscesses (so-called acute amebic hepatitis) subside and the patient becomes clinically well. Unfortunately, it has been my experience both as therapeutist as well as laboratory observer to note that the great majority of patients will subsequently relapse. Just how and when to expect and anticipate a relapse and the dependence to place on such laboratory examinations as we have at our disposal constitutes one of the big problems in the control of an infected patient.

In order to determine the type of examination best suited to a particular case, it seems wise briefly to review the parasitology of amebic infection. We believe that infection takes place by the ingestion of encysted or capsule protected forms of the parasite which pass down the alimentary canal to the cecum where the cyst sporulates and sets free four small ameboid daughter amebas. If these can survive long enough (or probably multiply in a particularly favorable cecal content) they may eventually be introduced through a break in the mucosa to the vascular submucosa where they are able to move about and find food in the form of fresh tissue juice and blood serum poured into the lesion in response to both protozoan and bacterial injury. The amebas almost invariably drag bacteria along with them as was noted several years ago by Dr. C. C. Bass and myself,[2] and recently again by Dr. Charles Craig.[3] Depending upon the resistance of the patient (rather than the virulence of the organism), a smaller or larger ulceration is produced, amebas swarm out into the cecal contents and subject the entire big gut to surface infection. The disease most often tends to localize in the dependent parts of the large bowel such as the cecum, sagging portions of the transverse colon or the rectum. Active disease in the cecum gives rise to an appendiceal or gall bladder like train of symptoms. Indeed the appendix itself is often involved. Dysentery with frequent bloody and mucoid stools and tenesmus is dependent upon involvement of the lower sigmoid and rectum, as these areas are more highly innervated. Occasionally the infection may be localized at both ends of the large bowel, or a massive infection may cover the entire area. Parasites invading the superficial veins of the intestinal mucosa may be conducted to the liver where they are unable to pass through the capillaries and thus produce abscesses by vegetative reproduction of the protozoan embolus itself.

In the quiescent period immediately following complete clinical cure it is usually impossible by any presently demonstrated means to determine a cure by the absence of parasites in feces or rectal scrapings. It is apparent that in a relapse we have the gradual multiplication of one or more groups of parasites that were covered up in small necrotic foci in the larger lesions that healed over rapidly during the period of medication. Clinically, relapse may occur by renewed open ulceration in the cecum, lower sigmoid and rectum, or by abscess formation in the liver. By far the greatest number of early relapses that I have recorded have been initiated by the finding of encysted amebas in an apparently normal stool with the patient presenting some more or less vague abdominal discomfort usually referable to the right side of the abdomen.

The mechanism of cyst production presupposes the wandering out of active vegetative amebas from an open lesion high up in the big gut. These motile forms become mixed with the liquid stool, and as it moves on down the normal big gut and becomes dehydrated, the amebas, being subject to the same influence, also lose water, become smaller and encyst or protect themselves by forming a cyst wall. The cysts will remain viable in a formed or hard stool for many days after its passage out of the body.

An examination of feces for amebic cysts should be made at monthly intervals for a period of at least twelve months following any apparent cure, even though there are no symptoms. We have had several cases that have shown

cysts after the lapse of thirteen and fourteen months of observation. In the search for cysts I would like to recommend the routine use of centrifuge-concentrated preparations and the low dry (16 mm.) lens of the microscope just as one uses for the detection of ova of the parasitic worms.[4] Saline purges "to bring down cysts" are apparently not useful.

A relapse in the region of the lower sigmoid or rectum is usually ushered in by the resumption of acute dysenteric symptoms. One patient in particular, I remember, who relapsed in the sixth month, had achieved an ulcer the size of a silver dollar within ten days after a proctoscopic examination that did not reveal anything resembling a lesion. It was evident that the lesion had progressed in the submucosa and suddenly the surface covering sloughed off.

Proctoscopic examination will often reveal small ulcers attending a slight clinical disturbance and from these one may scrape a drop of necrotic material with a small spoon curette for direct microscopic examination. I have never found cysts in the lesions of the rectum or in the bloody mucoid material adhering to a formed passage. Consequently this sort of material must be collected fresh and warm by the person making the microscopic examination, and the search centered on demonstrating actively motile vegetative amebas. In material removed from such lesions the number and characteristics of amebas found usually precludes any difficulty in identifying pathogenic varieties.

I have noted three clinical relapses limited to or beginning in the liver. One of these followed the continued presence of encysted forms in the stool without any gross clinical disturbance for a period of eight months. Another case developed the liver abscess which was operated and drained with a diagnosis of staphylococcal infection made from cultures, although a chocolate-colored pus was noted by the surgeon. Upon the onset of clinical dysentery a month after operation I was able to identify *E. dysenteriae* in stool and drainage material which had continued to discharge from the liver abscess. A third case relapsed with liver abscess within two months following apparent clinical cure of a dysentery, with no amebas demonstrable in the stool or rectal mucosa by proctoscopy. Vegetative amebas were demonstrated on the second and third days in material obtained through the drainage tube.

In conclusion, I would state that I have not been able to obtain any confirmation of Kofoid's so-called "excretion" of encysted amebas from my known amebic abscessed liver cases by examination of duodenal contents, and do not believe that at the present time we should go afield and diagnose amebiasis on phantom forms the size of yeast cells obtained by duodenal drainage.[5] On the other hand, the application of artificial culture to stools for diagnostic purposes as recently introduced by Dr. J. H. St. John[5] and confirmed by Dr. C. F. Craig[3] may eventuate into a means of still earlier detection of amebas in the diagnosis of infection or relapse. I have had as yet no opportunity of investigating this particular culture method, but am somewhat skeptical as to their identification of the *E. dysenteriae* which was cultured from 9.6 per cent of 73 medical students in the Army Medical School.

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DISCUSSION (Abstract)

Dr. R. W. Mendelson, New Orleans, La.—Dr. Johns stated that in liver abscesses we sometimes find cysts. His explanation of cysts is that they result from dehydration. How, then, would he account for cyst formation in the liver abscess? Out in Siam, where we have a clinic running from eight to twelve cases of amebic infection a day, we, of course, have a great many liver abscesses. I should very much appreciate Dr. Johns' explanation.

Dr. Charles W. Duval, New Orleans, La.—In cases of liver relapses, in which the lesions of the intestinal tract have all been cleared up, is there any recurrence of lesions in the intestinal tract? In other words, is intestinal amebiasis reestablished?

Dr. Johns (closing).—I believe Dr. Mendelson misunderstood me. I quoted Dr. Kofoid as saying that amebic cysts are "excreted" from the liver "area." I personally do not believe the liver excretes amebic cysts, which are the size of a small epithelial cell.

Answering Dr. Duval's question, one of my patients seen in consultation with Dr. Elliott, of New Orleans, came in in the routine way, was treated, and seemed cured. Eighteen months later he came back with liver abscess and was operated upon, and amebae were found in the abscess drainage. In another case the patient had been given a course of treatment that cleared all

the clinical symptoms, and while amebae could not be found in the stool a relapse occurred in the liver and amebae were found in the drainage from the liver. In another case the patient relapsed with liver abscess, and amebae were found both in the liver drainage and in the stool. He had been treated three months before. Dysentery re-occurred three weeks after operation for liver abscess. I went into the history, learned of the attack three months before, went back to liver drainage and found amebae there also.

FUNDAMENTAL CONSIDERATION IN PSYCHIATRY*

By Ross McC. Chapman, M.D.,**
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The purpose of this brief address is to put before the Section on Neurology and Psychiatry certain facts which are not new but which cannot be too often repeated, for on them must be based the intelligent interest and action of the medical profession through many years and many generations to come.

These facts are of equal importance to the neurologist and to the psychiatrist. Each of us deals with the other's problems if, indeed, those problems can be differentiated, for there is a broad zone in which our interests must always overlap. It would be most unfortunate if this were not so. The study of the integrative apparatus and of the mind cannot properly be carried on independently. The operations of the mind should be looked upon as a total reaction.

We will in this paper look at only one aspect of mental abnormality or mental illness.

The constitutional inferiorities are not considered here nor do we include those mental illnesses of known organic origin. We look forward with hope and confidence to the future valuable contributions of the physiologist, the pathologist and the biological chemist, but their findings are of little help to us today in the consideration of the great mass of mental illness.

We have for a long time recognized that an important aspect of our understanding of mental disease lies in the conception of the failure of the individual to adapt himself to some problem that life brings him. Mental disease is an expression of maladjustment. It is a compromise; it represents an effort on the part of the individual to meet demands that are too great for him.

We are, indeed, considered mentally normal about in proportion to the success we have in meeting our problems squarely. Our lives represent constant efforts at adjustment to our inner wants or needs or at adaptation to external demands.

The degrees of success of these efforts can be estimated only through a study of a cross-section of a selected entire population. The result on the one hand would include the so-called normal (the degree of whose success or failure is known best, perhaps, to himself or to those closest to him) and would then pass through all stages of ineffectiveness, incompetency, social, emotional and intellectual maladaptation.

If mental illness in all its varying degrees is an expression of failure on the part of the individual to meet demands on him in some adequate manner, why is it that so many of us confronted by the same demands manage to muddle through with some measure of success?

With this brief introduction, may I present three or four short histories which deal only with the essentials for our purpose? They are not comprehensive illustrations, but they will, perhaps, serve. All of them have been carefully studied. In only one was a physical component found.

Case 1.—A man of twenty-three, whose illness dated from about three months before admission to the hospital, had first shown a mild depression with talk of having no future, then that some one was interfering with his bond business, with the development of peculiar ideas that he had been poisoned and inoculated with syphilis. There was rather silly laughter and he seemed mildly confused. He developed an hallucinosis, was panicky and fearful and went into a stuporous state. He was blocked, negativistic and later more definitely paranoid. He thought his brain had been operated upon, that various changes had taken place in his body. He was seclusive and irritable.

His history showed him to be the sixth in a family of seven, the first five children being girls. His father died when he was five and he was brought up by his mother and older sisters. At the age of two he was beginning to be spoiled and difficult. What he wanted, he got by the simple method of screaming for it. There were frequent temper tantrums. A sister says he developed into a selfish, disagreeable youngster jealous of his younger brother, and she adds, "We all left home on account of him." His mother was his slave. We find him at the age of twelve or thirteen calling her vile names and referring to her as little more than a servant. He never tolerated interference on the part of others, but did as he chose himself. He was argumentative and quarrelsome. At sixteen or seventeen he began going out a little into society, but thanks to his training or lack of it he held himself superior to women. He did

*Chairman's Address, Section on Neurology and Psychiatry, Southern Medical Association, Twentieth Annual Meeting, Atlanta, Georgia, November 15-18, 1926.

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fairly well in school, but lived at home and left school at seventeen. The onset of his very serious psychosis dates from his first attempt to leave home where he was supreme to undertake work as a bond salesman in a distant city.

Case 2.—A youth of twenty-one suffered from a psychosis of acute onset characterized by periods of excitement alternating with a stuporous condition in which he was mute, immobile with eyes and mouth closed. He was forcibly fed. He suffered from hallucinations, was frequently combative and presented a very difficult nursing problem. During the two years following the onset the earlier catatonic picture became more hebephrenic and the prognosis was considered hopeless.

The history of this case shows the patient to be the second of a family of four children. His mother was a normal, attractive woman who in her relationship to her children was over-indulgent. The father was a most brilliant person, keenly intellectual, with a wide circle of friends with similar tastes. His chief recreation lay in discussion. He was fond of philosophy, sociology, science and when not devoting himself to his own profession he spent much of his time with other brilliant thinkers in a highly rarified intellectual atmosphere. He was proud of his children, ambitious for them and pushed them. Unfortunately, he had a biting wit, was given to satirical remarks and was really feared by his children on account of his ability to wound.

The patient passed an uneventful childhood, developed an unusually attractive personality and as a youngster was considered normal. He was athletic, popular with golfers and horsemen, but timid in the presence of girls. At the age of sixteen he began to do rather badly in school. His father recalled him and after much talk he returned to school to go on again with work in which he had not the slightest interest. On occasions when he was at home his father kept him closely by his side and continually tried to rouse in him intellectual ambitions. His interests lay along athletic lines and in the field of mechanics. The next two years were made up of attempts on his part to succeed, at his father's insistence, in school and in college. His sense of inferiority grew. Again and again he was made to feel humiliated and a breakdown finally resulted.

The first symptoms of mental illness noted occurred when after a long harangue by his father before which he was helpless he rushed to his mother, threw himself on his knees and said, "I can't, I can't go on." He was permitted to leave college and took a long motor trip with a young man, a friend of his. They drove to the Pacific coast and back, worked to support themselves some of the time, and he returned, apparently quite well.

There followed another attempt on his father's part to push him into a field where he was not interested, that of a diplomatic career, and his psychosis followed sharply on a few weeks association with a fussy, exacting envoy of our Government who treated him like a servant.

Case 3.—A girl of twenty-one developed a manic depressive attack with schizophrenic coloring. Her history showed her to have been brought up in pleasant surroundings. Her mother was a most capable woman of fine personality. Her father left home when she was very young and does not figure save through his absence. She was a bright, keen young girl, adaptable and popular with her playmates, but she suffered certain physical handicaps (unlike the other cases mentioned). She was very homely, suffered from nearsightedness and by the time she was sixteen had reached an unusual height. She was awkward, ungainly and felt her disadvantages keenly. She was always closely guarded by her mother who felt toward her as mothers usually do toward the ugly duckling. She had nurses and governesses, attended the most select private schools and traveled widely. She never looked after herself, however. Her wants were constantly anticipated and everything was done to blind her to her handicaps instead of teaching her independence in spite of them. Shortly before her entrance to the hospital in answer to her own entreaties the whole bulwark built around her was removed. She was entered as a student at one of the great co-educational universities where for the first time she was confronted with the problems of independent existence with no training therein. She found the college world painful and difficult. She became acutely sensitive to her deficiencies and the break came quite logically and unmistakably as a result of her lack of knowledge of how to adapt herself.

Case 4.—A boy of eighteen came to the physician in an acute excitement suffering from severe panic, combative and difficult to manage. The essential features of the case continued for several weeks to be those of excitement, talkativeness with flight of ideas, mischievousness and general psychomotor over-activity. He finally recovered.

His story is of no special interest until the age of puberty, where our attention is again called to the relationship of father and son. The mother was a cheerful, optimistic woman whose relationship to her son does not lend itself particularly to criticism. The father was a nervous, over-serious man who had never learned how to play and who maintained over his children a constant nagging oversight. The patient from childhood was headstrong and in more or less constant dissension with his parents, particularly, his domineering father. The effort of this boy to grow up is marked by much that is pathetic. Every attempt made to get away from home or to develop a feeling of independence was blocked by the father. There developed in the boy an antagonism toward him which increased with the passage of time. He became rebellious to all discipline and his psychosis followed.

These cases represent a few types of serious end results of the faulty handling of children by parents.

Case 1 presents the story of a spoiled child. The personalities of such children who have never been trained in the give and take of life afford a poor soil for successful development. Some considerable degree of failure is almost foreordained and serious difficulties as in this case are common.

Case 2 presents the final reaction of a son, the normal development of whose personality was greatly interfered with by a brilliant and domi-

nating father who gave no serious consideration to his boy's desires or limitations.

Case 3 is the not uncommon story of a young woman protected from all contact with the difficulties of life until her twentieth year, and her failure then to adapt herself to the ordinary complications of an independent existence.

Case 4 presents the serious results attending constant blocking by a parent of the natural and necessary strivings of a son for independence.

We may for our purpose look at the personality as the equipment of mental and physical attributes which we acquire through the years, from the time of birth, with which we have to meet as adults the problems of life.

That many reach adult years with badly warped personalities is well known. That the roots of failure or of mental illness are usually to be found buried in childhood and adolescent experience when detailed histories are obtainable is also well known. The careful studies made during the last fifteen years or so of the histories of mental patients from the point of view of personality development have opened our eyes fully to the importance of environmental influences during childhood and adolescent years.

The psychiatrist and the neurologist devote much of their time to end results, to serious conditions which have developed during years. It is difficult to analyze such conditions to the point of fully understanding them. It is even more difficult to correct them.

The time has come for a more intelligent approach to the question of maladaptation which is but another name for mental illness and for the great proportion of human failures to achieve a reasonable success.

Such an approach obviously is not by way of end results, but through an attack at the source, at the very beginning of maladjustment, or better, in the environmental forces found to foster maladjustment which are to be found in the formative years, the years of childhood and adolescence, during which the personality is molded for good or ill.

The types of problem children who without help later meet disaster are varied. They include the over-shy, over-sensitive, seclusive, moody, the incorrigible, the truant, those subject to temper tantrums, the spoiled child, the dreamer and others. Investigation almost always discovers the reason therefor in the immediate environment, that is, in the home life of the child or in his relationship outside the home with his playfellows.

That the child is as much an individual as his parents and that he needs intelligent study and attention is plain enough. That he frequently does not receive even a reasonable degree of such intelligent attention is too often proven.

The parent is often the direct cause of distressing behavior on the part of the child. The nervous child is usually the product of the management given him. The domineering or nagging, worrying parent, the over-solicitous, or neglectful father or mother, the parent with rigid conceptions of right and wrong which he forces on the child, the parent who rules by fear, the bullying brother or sister, the teacher of narrow vision and little sympathy or understanding, all these types and others exercise a harmful and sometimes a fatally harmful influence.

We deal here with demonstrable facts, not with hypotheses. Knowing with what we have to deal, it is not a hopeless task to outline plans which will afford a beginning for intelligent preventive work.

Children under school age are not usually easily accessible. There is perhaps little to be accomplished through efforts toward the education of parents of the present generation, still it is most interesting to note how eagerly many parents seek for helpful information and how earnest is the cooperation often given the physician in his efforts to meet the needs of some problem child. The interest shown in parent-teacher associations it seems to me is also significant. There is a real effort made by most of these associations to encourage intelligent discussion of common and individual problems and to ask for the advice of physicians.

It is not until the child enters school, however, that he comes under unprejudiced observation. At that moment two things of importance happen: (1) The training he has thus far had at home begins to be tested, that is, his adaptability is put to the test, and (2) he comes for the first time directly within the vision of the local and state educational organizations. Coincidentally, he comes probably for the first time in contact with the public health system of oversight.

Theoretically now all should be well. For several hours each day the child is under the beneficent guidance of the public school authorities, persons supposed to be specially trained to guide him during the most momentous pe-

riod of his life. He is open-minded, non-critical, suggestible and bursting with natural curiosity. For the first time he comes in contact with a large group of boys and girls like himself away from parental authority which up to now has been his sole guide. During these hours the teacher is all-powerful. There are for the youthful pupil innumerable new experiences, many of them outside the class-room in his social relations with his fellows. His powers of adaptation are from the first heavily called upon.

During these first weeks and succeeding weeks and years of school life the various forces in his environment are molding his personality. At college age his equipment, intellectual, social, moral, is the product of his experience thus far.

On his entrance to college the boy or girl is confronted by a largely new series of important situations, not the least of which is an independence of parental authority and of his other accustomed environmental influences.

Do our public and preparatory schools the country over meet the demands of the children who come to them for teaching and necessary social guidance? They do not.

Generally the public school teacher is a woman who occupies the position more by force of circumstances than by choice. She is young, not too well trained and is occupied with dreams of her own future, which will not include teaching school; or she is passing through the hard years when her dreams are being relinquished; or she is becoming elderly with more or less bitterness at heart over not having realized her individual hopes.

Our teachers should be adequately paid for the heavy load of responsibility they carry for the individual child, the family, the community and the state. But more than that, their training should be of a kind which should make them realize the character of their responsibilities. With that realization and with proper financial compensation our teachers in the graded schools or high schools will have a greater sense of the dignity and importance of their profession, will be happier and immeasurably more efficient.

Beginnings are being made. Some normal schools and many colleges are introducing courses which bring to the future teacher a better knowledge of her responsibility for the personality development of her charges.

In some school systems in the large cities an effort is being made to discover the peculiar child and to find out of what his trouble consists. Special classes have been formed for defectives with the intelligent aim of giving them a training within their capacities.

In some instances specially trained social workers take charge of the playground activities, a most important thing, and give to the child who needs it the encouragement or advice needed to establish the right sort of social adjustment. Medical advice relative to personality problems is sought by these schools.

In many of the larger universities and colleges the personality difficulties of the students are receiving intelligent attention at the hands of one or more physicians appointed for the purpose.

Yale University a year ago opened a new department, that of Mental Hygiene, under the direction of Dr. Arthur Ruggles.

The need for research in the field of personality studies of children as well as the establishment of child guidance clinics is being recognized by the larger foundations.

The Commonwealth Fund is planning a very large annual expenditure for work along these lines, their clinical group being headed by Lawson G. Lowrey who has done excellent work in various cities.

The National Committee for Mental Hygiene is planning extensively for the future of its educational and clinical work.

The very intelligent program of the Commonwealth Fund may be summed up as follows:

(1) To make possible further study for research in the field of mental hygiene for children, with special reference to the causes and methods of treatment of behavior problems.

(2) To provide facilities for the training of psychiatrists and graduate psychologists in practical child guidance work.

(3) To provide field training in child guidance for students in psychiatric social work.

(4) To afford adequate clinical facilities for the thorough study and treatment of children presenting problems in behavior and mental hygiene.

The mental hygiene movement is here to stay. It has originated forces for good far reaching in character which are affecting the individual, the state and the nation.

It is unfortunate that it must suffer from the lack of personnel trained to meet steadily increasing demands. There are few communities which like Memphis can command the services of a Williams, or like Cleveland a Lowrey or like Boston a Thom. As time passes this condition of affairs will improve.

The curricula of our medical schools give increasing importance to psychiatric teaching, and the training of nurses and social workers reflect the advances we are making in our preventive attitude.

May I depart somewhat from my main theme thus far to appeal not only to the neurologists and psychiatrists of this great Medical Association to whom it is not new but to the members of the medical profession generally to give consideration to the mental element in all illnesses of whatever kind, to regard the individual patient not only in the light of malfunction of kidney or heart, but from the point of view of his reaction as an individual in relation to his environment. That the physician of broad vision has always done this to some extent is not enough.

The physician, whatever his special interest may be should acquire, as a part of his professional approach, insight into the domestic, social and business relationships of his patient and his reactions thereto. He should ask the question, what is the setting in which this illness developed? With what is he contending as an individual in addition to his endocrin imbalance, or his appendicitis, or his broken leg? A great surgeon said recently that it had taken him twenty years to find out that his responsibility to his patient did not end with the obviously surgical relationship but must be carried on to the restoration of the patient in reasonable measure to his normal, social and industrial life.

Unless the physician studies the setting of his patient, unless he sees beyond the patient the family group particularly, he is apt to miss enlightening information which will help him not only in his treatment of the specific case, but will enable him to do sound preventive work in the mental hygiene field.

The great opportunities to advise family groups which come to the general practitioner are not so frequent in these days where the patient is attended in hospital and the history is taken in the physician's office or by a hospital interne.

We cannot go far until the medical profession as a whole realizes its responsibility to the public for the prevention of mental illness as it has lived up to responsibilities in typhoid fever and tuberculosis, and as it is now fulfilling its obligation in the study of the prevention of cancer.

After all the years of painstaking study in ward and laboratory we now know that typhoid fever does not occur if the public eats pure food and drinks pure water. Tuberculosis, it is said could be eliminated in thirty years if everyone would follow rigidly certain rules as to personal cleanliness.

Mental illness, the greatest scourge of all, which one of the Mayos has said causes more suffering than all physical illnesses put together, must be approached by us with the same intelligence.

We neurologists and psychiatrists with our common problems, our intertwined and indivisible interests must make of ourselves teachers and preachers to the members of the medical profession generally and to the public at large for the benefit of the child and the adolescent whose unsolved difficulties incident to their formative years are responsible for a great proportion of the suffering of humanity today.

The efforts to be made by us are along simple and practical lines.

(1) We should encourage all physicians by example and precept to look at the environment, the setting of the patient, and intelligently to estimate when possible the family group and its needs from the point of view of personality, difficulties, and the ensuing conflicts: in other words, to develop a group consciousness and a feeling of group obligation.

(2) We should do everything possible to improve the character and work of our public schools which now partake too much of the nature of some of our great manufacturies whose pride is in mass production of standardized articles. Our children must not be so regarded. They are of varied mental patterns and many of these patterns are delicate and require special attention. Our schools must pay attention not to the needs of its children *en masse* but to the needs of the individual child. The expression of intelligent interest on the part of the medical bodies of our communities in the needs of our schools as a public health measure, if you please, will go far in introducing to the public a new viewpoint as to education. The results will be shown in the development of a teaching force of broader vision and more adequate capacity.

(3) We should encourage in every way possible the efforts made by responsible institutions to establish child guidance clinics for the benefit of the problem child. These clinics are struggling to make clear their justified existence now in many cities of the country.

(4) We should encourage the establishment of domestic relations and juvenile courts where many of the more serious situations involving children may be better handled.

If the intelligent interest of the medical profession of the country can be aroused; if the profession generally can be brought to see as we see the importance in the life of the individual of his childhood and adolescent years, the most important years of personality development, there will be great changes wrought in our educational systems. New ideas of parental responsibility will creep into homes and the child will have an infinitely better chance for success as a man.

OSTEOMYELITIS OF THE PELVIS*

By E. LAURENCE SCOTT, M.D.,
Birmingham, Ala.

Surgical literature is replete with information concerning osteomyelitis, the manner of onset, the causative factors and the effects. The writer, however, has been able to gather but little from the literature pertaining to the manifestations of osteomyelitis in the pelvic bones,

Fig. 1.
Case I. Typical striated or fan like area of destruction. Compare with control marked A.

where, although it is not a rare condition, it cannot be classed as a common one. A comparatively small number of cases has been reported up to the present time, and an experience over a number of years has shown but five in our clinic. It is my desire to add these to the reports of other writers, and to recite very briefly the results of our study of this group.

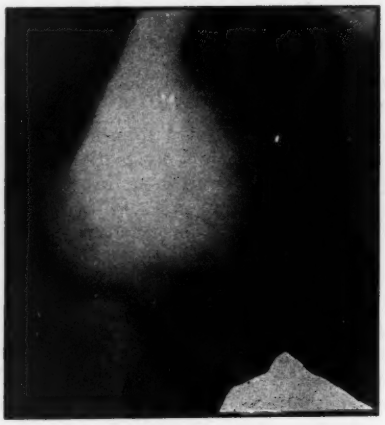

Fig. 2.
Control A. Sarcoma lower end of femur. Note coral like growth and extrusion. Appearance similar to picture of pelvic osteomyelitis.

When the term osteomyelitis is used we are accustomed to think of all types of bone infections, including tuberculosis and syphilis. The term is a very general one indeed, but in this study we are dealing with the ordinarily accepted osteomyelitis, and we inject tuberculosis

Fig. 3.
Case II. Striations of destruction from neck of os innominatum to periphery.

*Chairman's Address, Section on Bone and Joint Surgery, Southern Medical Association, Twentieth Annual Meeting, Atlanta, Georgia, November 15-18, 1926.

Fig. 4.
Case II. Position of abduction extreme, showing destruction of femoral head and invasion of upper acetabulum.

Fig. 6.
Case III. Typical picture of ilium osteomyelitis. Striations very marked. (Original radiograph shows periphery of ilium intact but rarified. (Print gives false impression of periphery.)

and syphilis into the discussion simply to show them as distinct and different types. It has been very difficult to definitely separate the malignancies (Control "A") and non-malignant bony tumors from osteomyelitis. A routine procedure to determine a definite diagnosis has been to use control radiographs of known cases, those proven clinically and through the end result as a check against the case in hand. In a case under observation, when we have noted a return to practically normal for the bone, the condition has been definitely typed, and this has been placed in the control file. This is an important feature in the study of pelvic bone infections. Not all cases showing osteomyelitis become operative in our hands since some resolve of themselves, while others will show a sinus and self-drainage prior to a proper diagnosis and surgery. When drainage was surgically produced, the laboratory returns showed the usual organism of osteomyelitis.

The clinical picture of osteomyelitis in the young pelvis is nearly always clouded, and could be called atypical. The symptoms are masked and rather indefinite. The onset is slow, the temperature is lower, and the leucocytosis is not so marked as in osteomyelitis of long bones

Fig. 5.
Case II. End result following surgical drainage, traction and supportive treatment. Function good, slight limp.

Fig. 7.
Case III. Result end of one year. Ankylosis in good position.

Fig. 8.

Case IV. Illustrating extreme result of traumatic osteomyelitis, following compound fracture of symphisis. Note epiphyseal separation head of femur; destruction ascending and descending rami.

with abundant marrow space. We usually think of osteomyelitis in long bones as a rapid fire performance and expect to have the picture pass before us quickly. This has not been our experience in flat forms of bone such as the ilium. The ilium seems the most frequent site for infection, and in an accompanying lantern slide a comparison between the structure of the iliac bone and other bones will be shown. This may explain the constant picture shown in radiographs of this group of cases.

The destructiveness of the disease in the pelvic bones is striking in the early stages, but equally interesting is the amount of repair that ensues after proper care. The early radiographs might incline towards a diagnosis of malignancy. If a diagnosis of malignancy is made by one not suspecting osteomyelitis, it is a forgivable mistake, but one fraught with danger to the patient, in that we can do nothing for the malignancy while much may be done for the osteomyelitis.

The question of primality of infection site can always be disputed, especially in very young patients. This, however, plays no part in the case other than to convince us of a correct diagnosis. In a large per cent of cases, infection elsewhere in the bone framework will be found, and it is interesting to think of the factor of increased resistance in explaining rapid repair when we know the pelvic infection to be a metastatic infection. In the frank trauma cases, and in the post-operative cases from surgical intervention in fracture, there can be no doubt in diagnosis.

The pain complained of by these patients is rather peculiar, vague and indefinite. It is, of course, somewhere in the region of the pelvis, most usually about the hip. The motions of the hip joint will reveal little at first, and if osteomyelitis is not suspected, it sometimes may happen that a study of an ordinary flat hip radiograph will be made and the case may be passed along. Herein lies the danger of an error in a casual survey of a child complaining of a vague pain somewhere around the hip joint. It is not a far assumption to accept abortive types of osteomyelitis, and we wish to stress the importance of proper radiographic technic in stereoscopic plates of the young pelvis.

After all, we are more concerned with an early diagnosis that is correct than we are with the treatment and surgery that must follow a diagnosis of true osteomyelitis of the pelvis. Our surgical procedures in this type of infection are fairly standardized, but there are some points in the management of this condition that justify a moment's consideration.

Granting a diagnosis of true osteomyelitis of the pelvis, involving the os innominatum, why should the treatment be so carefully thought out? Our first consideration is the hip joint itself. The roof of the young acetabulum is tripartate and but thinly clad with cartilage, therefore weakly resistant to invasion from above.

Fig. 9.

B. To illustrate thickness of neck of os innominatum, vascularity and blood supply to same.

Fig. 10.

B 2. Illustrating spongy appearance normal os innominatum in radiograph of dried specimen. Curved wires enter nutrient foramina.

We do feel though that it offers enough resistance to deserve attention and protection. Anticipating joint invasion at the height of the infection, these patients are put at absolute rest in bed, with traction to the limb of the affected side, and traction made in the line of deformity if muscle spasm exists. This is done in the hope of producing even a fractional separation of the head of the femur from the acetabular roof. This traction is continued and the position of the limb improved until it is such that, if invasion of the joint occurs, the limb will become fixed in ultimately the most serviceable position. It is reasonable to expect ankylosis when the hip joint becomes involved.

Palpable masses, inside and outside of the pelvis are watched for and surgical drainage promptly done if they are found. The construction of the iliac bone predisposes to rupture to the visceral side, and therefore it is to this side that we may expect to locate the pocketing of the escaped pus rather than to the outer side. There is no rule for this, but it is mentioned, since our study of the osteology of the os innominatum has shown the liability of this occurrence.

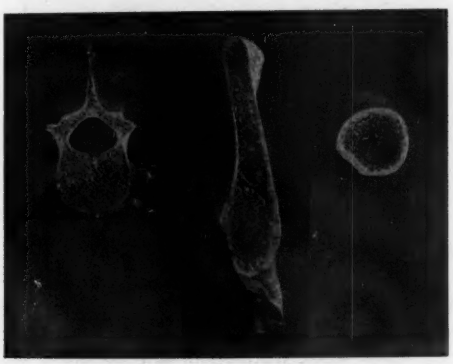

Fig. 11.

A. Cross section of vertebral body, os innominatum, and lower third of femur to illustrate trabeculation in each type of bone. Note II wide interspacing in os innominatum and axis of same which in part explains radiographic picture of osteomyelitis in this bone.

No radical surgery has seemed necessary, and apparently the less radical surgery done the better for the patient. The surgery should be direct and exact and free drainage should be instituted. If joint invasion occurs, the patient is treated in plaster spicas, without weight-bearing, until a state of healthy bone repair is noted. We would like to discourage radical procedures, as we believe them not to be needed. The true osteomyelitis seems rather a self-limited problem in the pelvis and readily yields to proper drainage. If the hip joint is not given early consideration, unfortunate position may result in permanent deformity.

SUMMARY

A summary of the cases reported in this paper would bring our conclusions about as follows:

(1) The importance of x-ray technic in films of the young pelvis.

(2) The early differentiation from malignancy and bone tumors.

(3) The importance of proper drainage.

(4) Careful attention to the hip joint during the fulminating stage of the disease and for a sufficient time during the stage of repair to insure the least damage to the roof of the acetabulum and femoral head.

THE ONLAY GRAFT IN THE TREATMENT OF UNUNITED FRACTURES OF THE LONG BONES*

By Willis Campbell, M.D.,
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In May, 1924,[1] a preliminary report was made of a technic in the treatment of ununited fractures based upon the results in seventeen cases. Since that time, this method has been applied routinely by myself and my colleagues

*Clinic, General Clinic Session, Southern Medical Association, Twentieth Annual Meeting, Atlanta, Georgia, November 15-18, 1926.

1. Arch. of Surg., 8:782-790, May, 1924.

in all ununited fractures, with an increasing percentage of satisfactory results. In consequence, a more comprehensive statement and a more definite conclusion can be made at present as to the relative value of the procedure.

A fracture is usually classed as ununited when there is free motion between fragments at the end of six months. However, there is no arbitrary time when distinction can be made between delayed union and non-union. If stability gradually increases, the prognosis for solid union is good. Only after a stationary period has been reached without effort to consolidate can the fracture be designated as ununited.

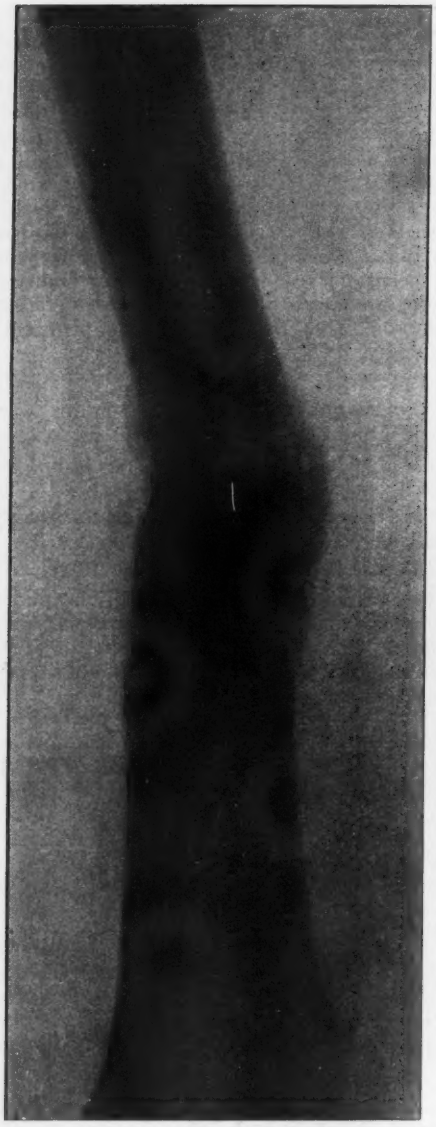

Fig. 1-a. X-ray of an ununited fracture of femur. Anteroposterior view.

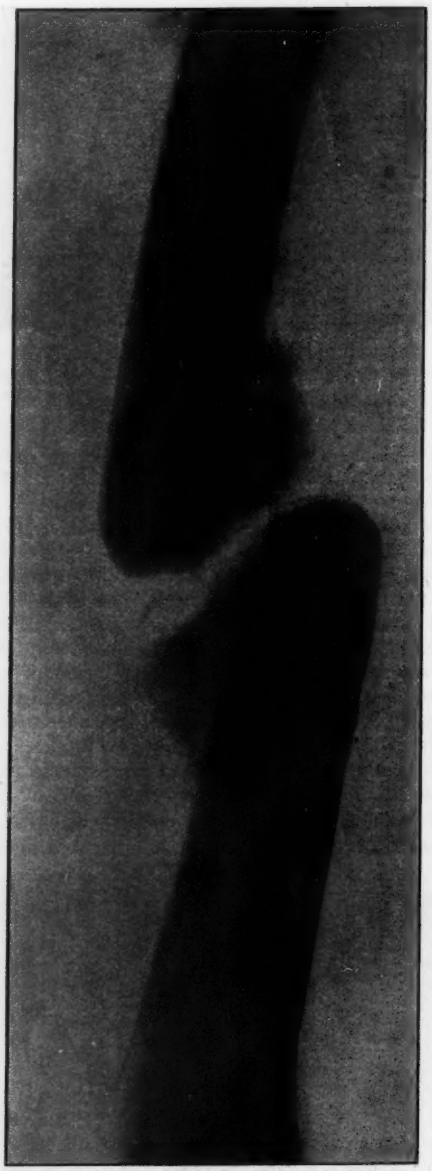

Fig. 1-b. Same as Fig. 1-a. Lateral view.

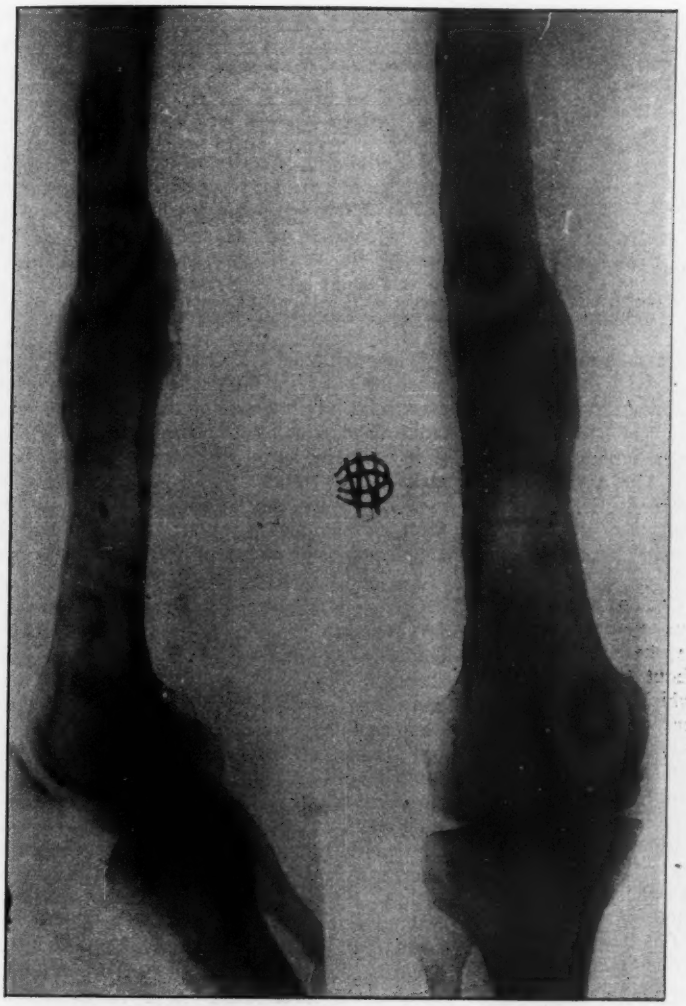

Fig. 2-b. Fig. 2-a.

Fig. 2-a. X-ray of end result following bone graft to femur, showing solid union. Anteroposterior view.

Fig. 2-b. Same as Fig. 2-a. Lateral view.

Ununited fractures at the present time are undoubtedly of more frequent occurrence, which may be considered the sequence to the actual increase in number of fractures as a result of the automobile and other industrial activities. However, the quantity alone does not account for the increase in fractures which fail to unite. This increase in recent years is probably due to three factors: (1) An increase in the severity of fractures, as evidenced by more compound fractures, more trauma to the soft parts, bones, nerves and vessels; (2) the occurrence of a greater number of multiple fractures, which makes a greater demand on the callus output of the individual, as evidenced by defective union at one or more seats; (3) incompetent and often inadvisable surgery, which has been caused by the evolution in the treatment of fractures to meet the demands of the x-ray. In former years, the physician was content with anatomical alignment, but at present perfect reduction is sought by repeated manipulations, which often fail and may impair the natural process of repair. Resort to open operation is employed too frequently, delaying union by mere incision and, in many instances, causing further damage by trauma. Should infection occur, the insult to nature is obviously even greater. The proof that union is influenced by multiple fractures has been questioned. I can only state that delayed union has been almost universally observed at one or more points where there have been multiple fractures, and that nonunion, in a number of instances, was a sequela of multiple fractures.

The mechanical art of efficient splinting apparently has been forgotten, if it was ever acquired. There is no field of medicine or surgery where propaganda for reform is more necessary than in the treatment of fractures.

In a review of two thousand five hundred and twelve fresh fractures from our private records, only ninety-seven open operations were found. This is a much higher percentage than

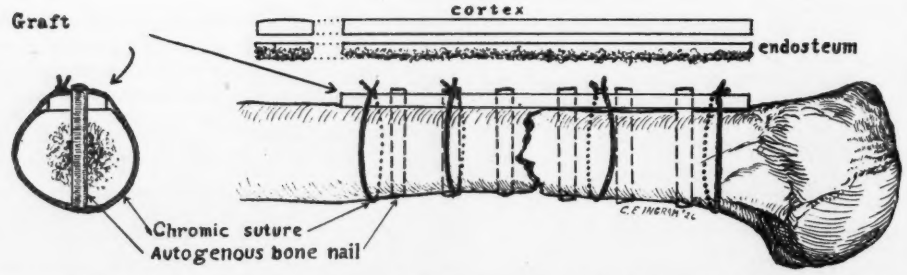

Fig. 3. Diagram showing detail of bone graft to humerus; graft held to fragments by autogenous bone nails and circular sutures of chromic catgut.

should occur in the average run of fractures, since many cases are referred to the specialist on account of unusual complications.

The etiology and pathology of non-union has been considered in a former report, to which reference may be made. The treatment of ununited fractures is prophylactic, constitutional and local or surgical. In any fracture of consequence, there should be a complete physical examination, with elimination of all defects, by which non-union often could be avoided. When the status of non-union has been reached, the cause may be ascertained and removed, but usually without the slightest effect on the local process, which is so completely organized that benefit from an indirect source cannot be expected. However, chances of success by subsequent treatment are materially enhanced. The calcium and phosphorous contents of the blood have received much consideration recently and probably should be estimated in all severe fractures, as well as those with delayed union, though the practical value of such an analysis has not been proven. This discussion, however, is confined to a method of local or surgical treatment of ununited fractures.

It is also of interest to relate that delayed union has been rare in two thousand five hundred twelve fractures, and non-union can be recalled in but one case, a femur with an old tuberculous hip in flexion and adduction deformity. Therefore, it is probable that local conditions and the manner of their treatment are dominant factors in securing union in fractures.

Success in the treatment of non-union may be secured at times by various methods, but in order to obtain union in a large percentage, there are three important factors which must be considered in every case and strictly respected: (1) rigid asepsis; (2) complete internal fixation; and (3) osteogenesis.

I have employed all the well-known surgical procedures, with a fair degree of success. However, solid internal fixation could rarely, if ever, be attained, which was a constant reminder that if it could be accomplished, the percentage of satisfactory results would be materially increased. With this in view, and the employment of the massive graft, as advocated by Henderson,[2] the following technic was evolved:

An ample incision is made through the skin in order to expose each fragment, when possible, for 4 inches (10 cm.). Routine dissection is made to the seat of fracture; all intervening scar and fibrous tissues are removed; the fragments are pared with a chisel or motor saw and each medulla is reamed out until normal marrow tissue is reached. The fragments are rotated until normal relation has been restored. An incision is made through the periosteum of each fragment, for several inches, depending on the length and anatomic location. The periosteum is stripped from one-half to three-fourths inch (1.3 to 1.9 cm.) from the circumference, leaving attached as much as possible the soft parts from which circulation is derived. With a chisel, "shavings" are removed from the circumference until there is a continuous flat surface for 3 or 4 inches (7.5 or 10 cm.) when possible, on each fragment. A broad, flat, massive autogenous graft is taken from the tibia, which should be of sufficient length, breadth and dimensions to secure firm fixation. With a motor saw, the graft is split longitudinally through the edge or small diameter into two parts, a strong outer plate consisting of dense bone or cortex, and an inner, of the endosteum. A strip of endosteum is placed within the medulla, bridging the seat of the fracture as reduction is made, normal marrow tissue rich in

2. Henderson, Melvin S.: Non-Union in Fractures: The Massive Bone Graft. J. A. M. A., 80:463-468, 1923.

osteoblasts being thus restored. From the outer plate, or as a separate graft, a strip of dense bone is taken, from which six or eight autogenous bone nails are made, of appropriate size. The strong outer plate is held to the flat surface of the bone, passing across the seat of fracture. Three or four drill holes are made through the graft and each fragment into which the autogenous bone nails are driven. A square peg in a round hold secures firm attachment. In addition, chromic catgut sutures are passed about the bone and graft. The remainder of

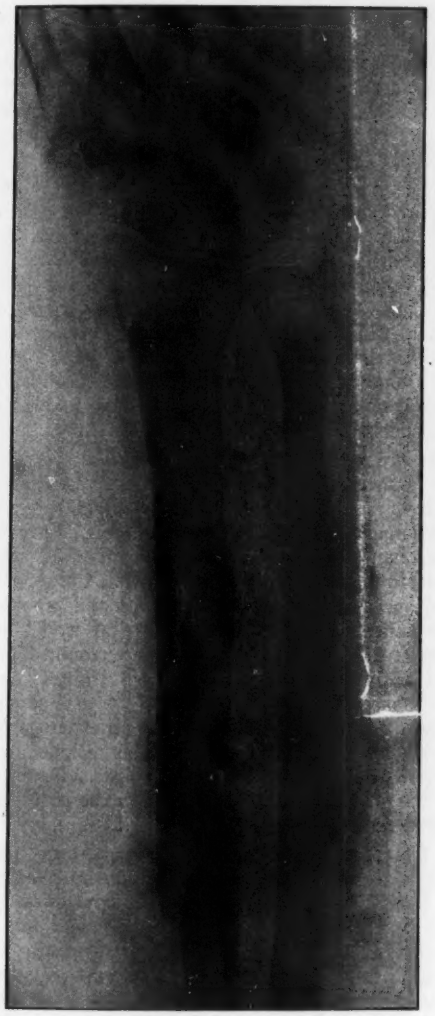

Fig. 4-a. X-ray of bone graft for ununited fractures of both bones of forearm. Antero-posterior view.

Fig. 4-b. Same as Fig. 4-a. Lateral view.

the endosteum is broken into small particles and placed with the "shavings" about the seat of fracture. If the graft is taken from the upper extremity of the tibia, it is often possible to obtain, in addition, small pieces of spongy bone to be placed about the seat of fracture. These are possibly more active in reproduction than dense bone; or, the osteoperiosteal graft may be added. The method of mechanical fixation is obviously the same that is accomplished by the Lane plate. Both fragments remain intact with minimum trauma or mutilation by chisel or motor saw. There is no further break in con-

Fig. 5-a. X-ray of ununited fracture of humerus. Note small graft (applied at a previous unsuccussful operation elsewhere). held to fragments by two metal drill points, and graft broken.

tinuity, but the seat of fracture is reinforced by a new autogenous osteogenic onlay, giving additional strength, stability and fixation.

The making of the autogenous nail is greatly facilitated by a rotary file, which is attached to a motor saw (devised by my colleague, Dr. Joseph I. Mitchell). The size of the nail is estimated by a drill guage. The use of taps and dies to make autogenous bone screws is ideal, but has proven unsatisfactory on account of the length of time and the amount of bone required, and the fragility of normal bone.

Extensive scars or adhesions of the skin should be excised as a preliminary measure before attempting bone graft. In fact, there must be ample investment of soft tissues over the field of operation and transplanted bone; otherwise, failure is certain. This may necessitate the shifting of a flap of skin and soft tissues in the affected part, or even the application of a pedicle skin graft.

The operation on the femur, especially on the upper third, frequently is attended by shock, with high mortality, unless the procedure can be completed within reasonable time. The entire operation should not consume a longer period than one hour. Extensive breaking loose of fragments and adhesions should be avoided. It is better to sacrifice one or two inches in length than to run undue risk of losing a life. A two-stage operation will often restore normal length, which consists of breaking loose fragments and the employment of skeletal traction until reduction is accomplished, after which the onlay graft can be employed. However, comparatively few individuals are financially able to submit to such a long process. Furthermore, skeletal traction is not without danger.

A slight variation in technic may rarely be required. In femora with a tendency to angulate, heavy silver wire or Parham bands may be necessary, in addition to autogenous nails, to attain complete fixation and to prevent displacement. If it is avoidable, however, metal should not be used in any form. Silver wire is also employed about the bone and graft when the fragments are atrophic or sclerotic, since in such bone no type of screw or nail can be firmly embedded.

In order to carry out this tedious procedure, the assistance of a team of trained associates is essential, as well as the most rigid asepsis. Instrumental technic is preferred. It is not a one man operation. One surgeon, with two assistants, prepares the fracture, while the second and one assistant remove the graft and prepare the nails. Otherwise, too much time would be consumed. Unless a surgeon can surround himself with associates who are well trained, operations of this type should not be attempted. There is no reason, however, why an experienced surgeon should not carry out the technic and obtain satisfactory results by proper adherence to the principles involved and with the requisite number of assistants.

The after-treatment is most important and consists of efficient external fixation by plaster-of-Paris casts or apparatus at the conclusion of the operation, which must be continued for a period of eight weeks. During this time, no motion is permissable in the adjacent joints, as this might disturb or induce the slightest strain at the point of fracture. It is better to run the risk of restricted motion than to fail to secure

Fig. 5-b. X-ray of graft to humerus, held by autogenous bone nails; beginning union. The final result was solid union. Same case as Fig. 5-a.

union. At the end of eight weeks, union is firm and a convalescent brace is applied, which must be constructed to permit the gradual increase of motion in adjacent joints. This apparatus should be worn for at least six months. In the lower extremity, external fixation and the gradual increase in weight-bearing is accomplished by some modification of the Thomas knee splint. Physiotherapy also is indicated at the same time, but must be given with great caution until normal strength has been restored at the seat of fracture, as determined by the roentgenogram and physical examination. Failure after bone grafts is often caused by re-fracture from very slight trauma. Therefore, protective apparatus must be continued until all danger is past.

In estimating the end results in operations for ununited fractures, at least six months should elapse before definite conclusions can be reached, and rarely, a much longer period. In the former contribution which was mentioned, the end results of seventeen cases were reported. Since this a sufficient time has elapsed since the treatment of sixteen additional cases to determine the results. This makes a total of thirty-three, the distribution of which is as follows:

Femur	6
Humerus	12
Tibia	4
Jaw	1
Both bones forearm	5
Ulna	1
Radius	4
TOTAL	33

Of the thirty-three ununited fractures, there were only seven in which no open surgery had been employed. Open reduction, with or without internal fixation, was carried out in nine when in the fresh stage, which is most suggestive as a contributing cause of non-union. Seven were compound fractures, which is a well-known etiological factor. Four were gunshot fractures. In twenty, from one to four operations had been unsuccessfully employed to induce osseous union, as was evidenced by numerous scars from previous incisions. The procedures which had been used consisted of: (1) open reductions with internal fixation by absorbable material or wire; (2) open reductions with applications of metal plates; and (3) autogenous bone grafts. In not one was there the slightest evidence of an adequate transplant, and simple open reduction and metal plates were notably unsuccessful. Of the thirty-three, there were two and one-half failures, the one-half occurring where two grafts were employed in non-union of both bones of the forearm, the one on the radius failing to unite. In all fairness, when two grafts are employed on two bones, as in the forearm, each bone should be considered separately. Furthermore, it is more difficult to induce union at two points at the same time. As there were five

with non-union in both bones of the forearm, five should be added to the total number of bones grafted, which makes a total of thirty-eight. Of the thirty-eight bones in which the onlay graft was employed, three failed to induce osseous union, which gives 92 per cent successful results.

As failures are always of interest, they will be considered separately. The first was in a humerus of a man aged 55. Operative technic was most successful and union was apparent for four months, as was demonstrated clinically and by the roentgenogram. There was then a gradual dissolution with a recurrence of non-union. The second case was an ununited fracture of the lower third of both bones of the forearm, the ulna about four inches above the wrist and the radius only two inches. Union was clinically solid and confirmed by the roentgenogram in both bones at the end of six months. Consequently, it was considered an excellent result, but when the next observation was made at the end of one year, motion was apparent in the radius. However, the patient considered the result excellent and would not entertain the idea of a second operation. The third failure was in a case of non-union of the upper third of the ulna, with dislocation of the head of the radius. Union was apparently firm at the end of two months and persisted for four months with retention apparatus, but spontaneous fracture of the graft with recurrence of non-union was observed in the fifth month. In this case, carelessness was undoubtedly the cause of recurrence, as it was impossible to impress upon the patient the importance of continued protection. A second operation was successful in inducing solid and permanent union.

The advantage of any surgical procedure is estimated by the percentage of successful results. By the use of the onlay graft, as above described, in thirty-eight bones (thirty-three cases) there were three failures. In 92 per cent osseous fusion was induced, which is a much higher percentage than has previously been attained by myself and colleagues with other well-known methods.

THE PHYSICIAN AND THE VENEREAL DISEASE PROBLEM IN 1926*

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and
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The history of medicine is replete with illustrations of the course which all permanent gains in conquering disease have taken. There is first the scientific stage during which the medical profession awaits the gradual discovery and correlation of essential facts about a disease, its etiology, diagnosis and treatment. There follow studies of its prevalence, distribution and prevention. Then come demonstrations of the results obtainable by application of all this knowledge. This is succeeded by efforts to educate the public regarding the advantages and practicability of general application. Finally there come to the medical profession and the public health authorities the opportunity and challenge to render a great service to society by accomplishing the control and eradication of the disease in question.

The histories of syphilis and gonorrhea have followed this course. Only in recent years have the educational efforts attained sufficient headway and extended to a large enough group of the population to enable the public health officials to begin effective work. Perhaps only now in 1926 can it be said that the ground is fully cleared for the active participation of the medical profession as a whole. The profession has repeatedly shown willingness to do its part when a practical program has been fully developed. This program seems now to have been blocked out at least as to essentials:

(1) Every physician should understand the problem of combating the venereal diseases.

(2) He should be equipped to diagnose cases of syphilis and of gonorrhea in his field of practice, or to secure such assistance whenever the presence of these diseases cannot be clearly eliminated from his diagnosis.

(3) He should be qualified to treat such cases arising in his practice or arrange for their adequate treatment.

(4) He should endeavor to follow up his cases to insure their continuous care and supervision until completion of treatment.[1]

(5) He should instruct his cases how to protect their own families and the community from infection by themselves, or make definite arrangements for their instruction.

(6) He should cooperate with clinic and hospital authorities in earnest efforts to secure prompt and adequate treatment of all cases discovered in the community.

(7) He should likewise cooperate with the health authorities in endeavoring to discover and correctly diagnose all cases, and to record and

*Read in Section on Public Health, Southern Medical Association, Twentieth Annual Meeting, Atlanta, Georgia, November 15-18, 1926.

**American Social Hygiene Association.

1. Brunet and Edwards: The Follow-up Problem of Venereal Disease in Private Practice. Jour. Social Hygiene, 12:4, April, 1926.

appropriately use data regarding the progress of the work for control of these infections.

(8) As a special measure of exceptional importance, he should promote the diagnosis and treatment of prenatal cases and of infections among children and married women.

(9) He should do his share toward educating the people of his community regarding the dangers and the prevention of venereal diseases.

(10) He should be interested in research on problems of syphilis and gonococcus infections related to his specialty, and contribute the data collectible from his own practice to the advancement of medical and sociological knowledge of these diseases.

Under every one of these headings there now exist practical measures available for each physician who enlists in this battle for another great victory over the disease enemies of mankind.

In this instance, the word mankind may be applied literally, for the veneral diseases are distributed everywhere among all nationalities, both sexes and among all age groups. While this is true, it is also true that the period of the greatest number of infections is in late adolescent and early adult life. Consequently, if we are to seek any one point of concerted attack, it might well be those cases which occur among individuals from 15 to 25 years of age. This group is the one most extensively and frequently examined by physicians for various reasons: for life insurance, for employment, for college entrance, for army and navy service, for admission to fraternal orders, and for many other purposes. It happens too that this group presents possibly the least difficulty in arriving at a differential diagnosis and instituting effective treatment for which the individual or organized business and industry will pay. It is the group worth saving from the standpoint of society at large and of the race. The challenge lies before physicians who conduct all these examinations to make certain that syphilis and gonorrhea are not overlooked. It may well be that more facilities, more assistance, more expense will be required, but with the insistent demand of the organized medical profession all these things will be supplied. One can grow enthusiastic about what would happen to the lowering incidence of syphilis, for example, if all these opportunities for medical examination could be fully utilized by the physicians in charge.

Sir William Osler said: "Know syphilis and you know medicine." This is another way of saying "Syphilis is the Great Imitator." To this fact all the specialties of medicine and surgery attest. The increasing participation of ophthalmologists, psychiatrists, obstetricians, internists, and of practitioners in other fields not previously interested in the organized campaign against this disease has been of great value already and can be extended without limit. The gynecologists have emphasized gonorrhea as the great sterilizer of the race; and to this charge may be added the tragic consequences of ophthalmia, pus tubes, peritonitis, arthritic joints and other sequelae of the original infection which make the gonococcus a close second to the spirochete in the extent and variety of its insidious and disastrous attacks on mankind. Collectively the practicing physicians in their daily rounds of office and bedside visits are in a position to detect most of these syphilis and gonorrhea infections and by teamwork can keep them under treatment. From a practical point of view the physician's private patients are vitally important to society, because they include in their numbers the more successful portion of the population, whose illness means relatively more serious loss to industry, to homes, to community life, than illness of those individuals who attend the clinics, or who are found through examination of applicants for charity, free lodgings, or in other similar ways.

The organized efforts, official and voluntary, in behalf of the child and of maternal welfare have opened up large opportunities for discovering venereal diseases, syphilis particularly, and for getting both mothers and children under effective treatment. The aid of federal bureaus, state and local boards of health in confirming diagnoses and in supplying drugs and facilities for treatment when necessary, together with the aid of nursing organizations and hospitalization facilities as required, have completed the essential equipment for dealing with this important group of the infected population. Completed, except for one thing! The medical personnel to make it function. This latter personnel must be exceptionally high grade, tactful, sympathetic and efficient. The call for volunteers has been urgent, and for special projects the response has been most creditable, but the medical profession should help the public to understand the extent and cost of professional services for this purpose which must be provided from public or philanthropic funds. One difficulty has been that the individual physician has devotedly given his services without ever reducing them to a remuneration basis or asking public acknowledgment of the sum in the same way

a money contributor receives credit for a check for the same amount. The public has not known how to estimate this, and the medical profession has not included such figures in its fee bill to guide physicians in estimating their contributed services. Of course, the service is appreciated by those who know about it, and the physician does not like to place any monetary value on his generous gifts of this character. But in the interests of equity, all this service should be estimated and shown to be required as supplementary to the work of private practitioners in their own practices; only then can a community determine what additional personnel is necessary to round out a complete service for this phase of the problem.

Periodic health examinations are slowly evolving into a useful and practical medical service for which every physician should be equipped. When this finds its proper place in the practice of medicine, it will constitute one of the greatest weapons against the venereal diseases, particularly because of the opportunity it affords to detect the "missed cases" and those who at the beginning of their infections did not come under observation of physicians. If this weapon is to be used, however, the venereal diseases must be given far more serious attention in medical schools, in post-graduate courses, and in special courses for practicing physicians. Observation all over the country indicates that this is coming about.

Perhaps nothing more need be said to illustrate the need for enlisting all physicians in the campaign against the venereal diseases. During the past ten years the organized profession, including the American Medical Association and its affiliated state associations, has endorsed the principles of preventive medicine as applicable to these diseases.

By publications, lectures, symposium discussions, public meetings, exhibits, the importance of applying these principles has been explained and advocated. Recently both national and state demonstrations of practical details of diagnosis, treatment and public health measures have been increasing. This is most significant and encouraging. The attention given the various phases of the problem at this meeting is an illustration. The next step seems to be stimulation and aid by state associations to county societies to include the demonstration material in their yearly programs.

There are various technical and some difficult problems to be worked out pertaining to the relations of physicians and health officers; the payment of physicians for clinic or office service for which patients do not pay; the responsibility of physicians for reporting their cases or demanding observance of measures for preventing the spread of infection from patients under their care; and similar questions. None of these, however, presents insuperable difficulties, and all of them now have a background of extensive experimentation in different parts of the country. For a paper of this character these questions may be passed over without further comment, except possibly two or three which have claimed a good deal of controversial publicity.

It is natural that the physician, like the health official, should hope for great results from the application of a scientifically demonstrated technic of preventing the development of infection after exposure. Chemical prophylaxis has all the laboratory and clinical research foundation on which so many of our brilliant victories over micro-organisms causing diseases have been built. To the extent that physicians can apply this prophylactic technic themselves within the necessary limitations of time to be effective, it is a factor in reducing the number of infections resulting from exposure. But the practical difficulty has been that all the thoroughness and skill of successful disinfection of wounds are required, while neither physicians nor patients have generally recognized and acted on this principle. Only in armies and navies, where some approximation of promptness and thoroughness can be enforced, has there been any appreciable influence of this procedure on reduction of venereal diseases as a whole. Up to the present time no civilian measures have been devised to insure the effective application of such measures, except in private practice or exceptional instances in industry, where men are isolated or under essentially military control for the time-being. For success in utilizing this weapon against venereal diseases two things are essential which are lacking now: first, the medical profession must take the same responsibility for thoroughness of application which they uncompromisingly advocate and demand for serious preventive measures in other dangerous infections; second, the practical methods for educating and inducing persons exposed to infection promptly to seek adequate disinfection must be correlated with and in harmony with public policy regarding all the factors involved. If these conditions are not met, the technic will continue to be faulty, actual disinfection will not occur and the prestige of scientific medicine

will suffer on the one hand, while society will fail to reap the benefit it had hoped from lessening the burden of these diseases. Physicians are familiar with similar situations in many fields of medicine. At present we can proceed in our attack on cancer only as the public can be induced to seek early diagnosis and advice. We can hold our ground against smallpox only to the degree that knowledge of vaccination continues to be applied by the great majority of citizens in each generation. So it is with great pox, and its associate in the venereal disease group; we can make progress only as a balanced and sound program is developed, accepted by the public and generally applied. At present chemical prophylaxis is one of the scientific measures against venereal diseases which remains on the shelf, because all these essentials have not been provided. It is, therefore, expedient to avoid controversy or undue emphasis on its academic value.

Theoretically, again, it is natural that the health officer and court and police officials should have invited the medical profession to help examine and isolate infected prostitutes, since they constitute foci of infection for large numbers of persons. Experience, however, has demonstrated that no practical way exists to examine effectively even the women engaged in recognized commercialized prostitution; much less to secure the examination of their male partners and of all those engaged in clandestine prostitution. Probably no preventive measures in the interests of public health, except control of pestilential diseases such as plague, have been worked on more persistently and with all the power of the police and courts to detect prostitutes, compel their examination and secure their treatment. As a public health measure, the plan does not work; and even if adequate technical medical requirements could be devised, the confusion of police with health department functions and opposition to public recognition and promotion of prostitution would prevent their effective use until a policy sound morally as well as medically could be developed.

One other point on which the trial and error method has been necessary in testing out the utility of a theoretically sound measure is the notification of venereal diseases. There is no question as to the scientific value and desirability of the health officer's ascertaining the prevalence of syphilis and gonorrhea and the foci of infection in his jurisdiction. But human beings are the carriers and any publicity regarding them would seriously injure their standing in the community. Under these conditions the infected persons and their physicians have demanded before agreeing to notification that the health officer show convincing proof that he can use such knowledge for the protection of the community without damage to the individuals reported. This has been difficult to do in a convincing manner. The full cooperation of patients and physicians and the understanding, sympathetic support of the public are essential to the full use of notification. These ingredients of success have not yet been simultaneously forthcoming in most communities. As a transitional measure, a working agreement has gained ground in many states whereby the health officer recognizes the physician as his special agent who reports each case of venereal diseases by number only, so long as the patient satisfies the physician that he is observing all the precautions necessary to protect other members of the community from infection. If the patient does not comply with instructions or fails to continue treatment, his name and address are then sent to the health officer. This interpretation of notification laws gives the health officer the most important data which he needs and permits his close cooperation with the physicians especially concerned in treating venereal diseases without pressing the controversial point of notification by name and address. This procedure has much to recommend it, and suggests other ways in which the health department and the rank and file of competent physicians might cooperate in dealing with certain other phases of communicable diseases. Doubtless in the course of time, as has been the case with tuberculosis, an educated public opinion and a better understanding of the problem by physicians, patients and health officials will bring about general notification without opposition.

A question we need frequently to ask ourselves is: what have been the results of the campaign thus far? Perhaps there is time for a partial list of such results.

The last ten years have seen great strides toward the development of a practical program. In a survey of two hundred and twenty-seven cities in 1913, physicians as well as the public were found to have little interest in the problem of combating the venereal diseases. Only four cities had free venereal disease clinics; three provided hospital care for dangerous cases; forty-six provided diagnostic facilities for syphilis; and

only seven made any attempt to study the prevalence and control of the disease by requiring any form of notification. By contrast, a survey in 1923 disclosed that practically all of the one hundred cities having a population above 70,000 had some regulations for notification and showed increasing use of reports; 82 per cent had free laboratory diagnostic facilities; 100 per cent provided free clinical treatment to supplement the work of private physicians; 65 per cent provided hospital or other facilities for isolation of dangerous cases; 79 per cent recognized the venereal diseases as a major subject in their public health education programs. During the past three years replies to annual inquiries show that continued progress has been made along these lines, and that these statements are largely applicable to smaller cities also. In addition to national recognition of the venereal disease problem, which resulted in establishing the Division of Venereal Diseases in the United States Public Health Service, every state has a bureau of venereal diseases or its equivalent, or assigns special personnel for this purpose to its division of communicable diseases; and provides for diagnostic laboratory aid to physicians and institutions throughout the state. Many states also provide drugs and supplies under specified conditions. Both in private practice and in clinics the treatment of syphilis has shown encouraging gains in the number of patients who remain under treatment until discharged. All of the cities now have general nursing service for venereal disease patients in connection with their hospitals or clinics.

Some idea of the relative importance of syphilis may be gained from the fact that in New York State it ranks among the first three or four diseases reported; for the years 1921-23 the order of rank was measles (161,330), pneumonia (84,879), syphilis (75,090), tuberculosis (71,356) and scarlet fever (67,728). For the United States 200,584 cases of syphilis were reported to the state boards of health in 1925, and as might have been forecast the reporting of gonococcus infection fell behind syphilis with only 165,523 reported in 1925. Chancroid cases numbered 6,706. The cost of these cases alone on any basis of calculation produces a staggering sum; likewise the requests for laboratory diagnostic aid are below the expected total, even when the same ratio as that for syphilis tests is computed. The reasons for this are obvious. However, taking the reports as filed, they add enormously to the toll of human misery and ill health chargeable to the venereal disease group.

We may point out some other social consequences of the venereal diseases with their demands on the public purse. A recent review of applications for pensions from public funds in Missouri on account of blindness showed the venereal diseases in remarkable significance. Of about six thousand cases of blindness, 25 per cent were attributable to gonorrhea. Almost 10 per cent were cases of optic atrophy due to syphilis, not to mention other eye impairments caused by syphilis. Congenital syphilis may be the cause of blindness, deafness, deaf-mutism, crippled bones, feeble-mindedness, or other disabling physical impairments, with the accompanying necessity for institutional care. Wassermann tests in many psychopathic institutions have shown between 15 and 30 per cent of the inmates syphilitic. A careful study of the Government Hospital for the Insane led to the conclusion that at least 10 per cent of the insanity in the institution is attributable to syphilis. That gonorrhea is a frequent cause of blindness is well established. Probably 60 per cent of blindness from ophthalmia neonatorum is the result of gonococcal infection of the child's eyes at birth.

Sir Arthur Newsholme[2] recently pointed out that there has been a marked decline in the registered mortality from syphilis in England and Wales between the years 1901 and 1924, and other significant changes. In 1901 the combined death rate from syphilis and other conditions caused chiefly by syphilis, namely, general paralysis of the insane, tabes dorsalis, and aneurysm, was one hundred and sixty-six per million of population; in 1924, one hundred and eighteen per million, a total decrease of 29 per cent. The highest point in the death rate was reached in 1917 with one hundred and seventy-four per million. A remarkable decline occurred between that year and 1924 of over 32 per cent. Other official figures from government venereal disease treatment centers are similarly significant. The number of clinics increased from one hundred and thirteen in 1917 and one hundred and thirty-four in 1918 to one hundred and ninety-three in 1925, or 44 per cent increase in the latter period. The total attendances of patients in clinics were nearly quadrupled between 1918 and 1925. Between 1918 and 1920 new patients with syphilis increased 59 per cent; with gonorrhea, 129 per cent. However, from 1920 onwards a steady decline in the number of new patients register-

2. Newsholme, Sir Arthur, M.D., K.C.B.: The Decline in the Registered Mortality From Syphilis in England. To What Is It Due? Jour. Social Hygiene, 12:9, December, 1926.

ing subsequently occurred for both syphilis and gonorrhea. In the year 1925 the trend in numbers of these infections was slightly upward. The very important increase in proportion between attendances and number of new patients points to the conclusion that the decrease of patients since 1920 is not due to diminished popularity of the clinics, but represents a real diminution of disease, and this conclusion is rendered inevitable when this decrease is compared to the decrease in registered mortality from syphilis.

After discussing the available data, Dr. Newsholme says:

"We may definitely conclude that after 1917 there set in a remarkable reduction in the mortality from and incidence of venereal diseases, and that this was coincident with the initiation of national measures for the diagnosis and treatment of these diseases, and for associated educational efforts."

In the United States, as in England, and in other countries, it is not extravagant to forecast an accelerating rate of progress in the next ten years. And if this proves to be the fact, it is probable that the first half of the Twentieth Century will have recorded the control of these diseases to a point where they may even be considered of minor importance in preventive medicine. At least, these are the possible rewards for which society is striving. Whatever degree of success is attained, however, can be reached only with the full and enthusiastic participation of the medical profession.

CANCER OF THE LARYNX*

By R. C. LYNCH, M.D.,
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I do not propose to bore you with a long dissertation upon the diagnosis of cancer of the larynx. For those of you who are not particularly interested in laryngology, I should like to have you carry home with you one predominant symptom of cancer of the larynx, and that is hoarseness. The hoarseness varies from the least feathering of the voice to aphonia. I have been accustomed for many years to think of cancer of the larynx as divided into two separate groups: the intrinsic group, that in which the cancer is limited to the cartilaginous box, and the extrinsic, in which the growth is outside of the cartilaginous box. For the last ten or fifteen years I have been trying to standardize my inclination, to obtain the best results from operative interference. One of the first steps was the regrouping of the intrinsic division of carcinoma of the larynx into three phases. The first is the smallest outcropping of carcinoma, which it has been my privilege to observe twenty-two times in the last fifteen or eighteen years, where the tumor varies in size from the head of a pin to that of a grain of rice. This lesion is a surface lesion and the hoarseness which it produces is due purely and solely to the mechanics of improper approximation of the vocal cords rather than a dysfunction from muscular invasion.

I have operated by means of suspension and dissection on this selected group of cases twenty-two times in the last fifteen years, with the result that 100 per cent of the patients are well, without recurrence, from two to fourteen years after operation. I hesitated for some time before making this statement until I was sure that the results would bear out the statement before it was made. In this region the carcinoma is purely a surface affair and is easily amenable to treatment. If you will bear this one fact in mind and refer the patients who are hoarse for a period of six weeks or longer without definite cause or definite reason, for critical laryngological examination, we can probably increase the percentage of our patients who are well without recurrence.

In the second group of cases the outcropping involves somewhat more of the vocal cord, and there is lagging of the cord rather than fixation of the chain. Where there is lagging of the cord the indication is that the growth has extended beyond the mucous membrane and is invading the muscle tissue. It is in this group of cases that the most critical examination must be made. For the last five years we have been using microscopic magnification of the cord by means of the Zeiss binocular loop in the living patient to determine, if possible, the extent of the invasion of the cord before operative treatment. A certain group of these patients are amenable to dissection by aid of suspension, and 62 per cent of the patients so selected have been well, without recurrence, for periods of from two to fourteen years.

This same group is amenable to thyrotomy, or window resection, depending upon the individual's selection of operative technic.

The third group where there is fixation of the cord, which was considered for many years

*Clinic, General Clinic Session, Southern Medical Association, Twentieth Annual Meeting, Atlanta, Georgia, November 15-18, 1926.

to be the first symptom of carcinoma of the larynx, we now look upon as the terminal diagnostic stage between the intrinsic and the extrinsic groups. Where there is fixation of the cord I feel sure that the indication is that the lesion has involved muscle tissue, probably perichondrium and cartilaginous tissue as well. It is in this group that we have found metastasis in the lung in five out of sixty patients where the tumor was really intrinsic in the larynx. Under these circumstances any operative procedure on the larynx would be unjustifiable.

I call your attention to this fact that, in going over these patients before operation, you may not neglect a critical examination of the lung to be sure that there are no metastases there. Patients with fixation of the chain are candidates for laryngotomy, and it is in this group that we have obtained the best results.

The extrinsic group of cases, in which the tumor is outside of the larynx involving the laryngeal wall, or partly outside of the cartilaginous box, is multiple carcinomatous, and any measure directed to the larynx alone is a local means and the results are poor indeed. We select for laryngotomy those cases with fixation of the cord where the tumor has extended through the length of the cord, where the patients may have hoarseness, almost an aphonia, and possibly some referred pain or earache.

We have performed laryngectomy one hundred and fourteen times on the cases selected as outlined, with the result that 63 per cent have been well, without recurrence, from one year to fourteen years. This group of cases has shown but one death, and occurred as the result of heart block. There have been recurrences in a certain number, the recurrences appearing from ten months on, but so far our results are 63 per cent well, without recurrence. We speak of them as well without recurrence instead of "cured" in order to get not only ourselves but also the patient in the right psychological mood for more continuous observation. It is my impression that cancer is rarely ever cured. One never knows that a patient is cured.

The laryngectomy is not so mutilating as one would expect. About 60 to 70 per cent of the patients develop a voice which is good enough to allow them to associate and communicate with their fellowmen and therefore does not ostracize them from society. They are happy, they are well and they are grateful for being relieved of this dreaded disease.

The operation is done in one stage in practically all instances. With the exception of one of my cases, it was done in one stage. A few times it has been necessary to do a preliminary tracheotomy, but if this is not necessary it is not done. We use a method of operation not wholly different from those which are described, but the technic of the procedure differs here and there in its detail. Our great battle, and two battles confront us, is the preservation of a complete, dry, unobstructed airway. The second is the blocking off of the tracheal end of the stump from the mediastinal tissues. Our efforts are to free the trachea, lifting it up practically out of the wound, and dividing it into two parts. When it is divided the trachea is pinned with safety pins in the lower edge in such a manner as to keep it out of the wound, thus avoiding any insufflation of blood into the airway. The trachea is then fitted snugly with a large rubber tube, and this is pinned into it in such a manner that no blood can get in from outside. Through this tube the anesthetist has full control over respiration and the trachea is entirely out of the field of operation. Dissection is carried on from below upward, and our next effort is to create as small an opening as possible in the pharyngeal space, and my impression is that the best results are obtained when the epiglottis is included in the removal. Those patients who retain the epiglottis find less difficulty in developing speech, but there are some instances where the epiglottis was retained and recurrence apparently took place at the stump of the epiglottis. For five years we have removed the epiglottis in all instances with the larynx in order to avoid this possibility.

634 Maison Blanche.

TORULA INFECTION OF THE NASOPHARYNX*†

By E. Lloyd Jones, M.D.,
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Torula is the name given the pathogenic yeasts which closely resemble the oidiomycetes (blastomycetes). Of the twenty-one cases reported in the literature, eighteen have involved

*Read in Section on Eye, Ear, Nose and Throat, Southern Medical Association, Twentieth Annual Meeting, Atlanta, Georgia, November 15-18, 1926.

†From the Department of Oto-Laryngology, Wheeling Clinic.

the cerebrospinal nervous system and have manifested symptoms entirely cerebral in character. The case reported below is of interest, first, because of its rarity, since no case of torula infection producing gross destructive lesions in the nose or throat alone has thus far been reported. Secondly, it shows the possible relationship between a fungus infection in the tonsils and nose, and the brain cases. Thirdly, it is difficult to differentiate this lesion from the lesions of syphilis, tuberculosis, carcinoma, and oidiomycosis (blastomycosis); and fourthly, the disease has been invariably fatal in the brain and lung cases, whereas my case is now in an arrested condition.

CASE REPORT[1]

History.—J. S., a white man of 34, was referred to the Wheeling Clinic by Dr. E. W. Turner, of Belmont, Ohio, November 11, 1924, complaining of deafness, tinnitus and difficulty in breathing through his nose. There was nothing in the past history that had any connection with his condition except an unusually severe attack of tonsillitis in December, 1922. The throat remained irritated for a long time thereafter so that in March, 1923, he had his tonsils removed. The right fossa did not heal properly. The patient felt that there was tonsil tissue left behind. Two months later he returned to the surgeon, who looked at the throat and had a Wassermann test made immediately. This was negative, whereupon the tissue was removed in a second operation. No study was made of this tissue. The tonsillar fossa healed in a short time and gave no further trouble.

In March, 1924, the right ear became deaf. Difficulty in breathing through the nose had been present for some time previously, but as the onset was insidious it had caused little concern. There were several swellings in the roof of the mouth which made their appearance shortly after the removal of the tonsils, and as they caused no annoyance they received no attention. These swellings became tender and increased in size at the time the right ear became deaf. The left ear became deaf in August of the same year.

Examination.—A functional test of the hearing revealed a partial loss of hearing due to pathological changes in the conductive apparatus. In the nose the posterior end of the septum was so thickened that inspection was impossible beyond the anterior half of the nasal cavities. No tonsillar remains could be seen. There was a moderate amount of scar tissue in both fossae. On the right anterior pillar were two nodules about 6 mm. in diameter, slightly elevated. Over the soft palate and the posterior portion of the hard palate were six similar nodules producing an undulatory appearance of the surface (*Fig. 1*). The mucosa covering these nodules was unusually pale, yellowish-white, as though an abscess were beneath. The nodules in the palate were slightly tender to the touch. No inflammatory reaction was present. There was no evidence of any acute infectious process or ulceration. By mirror and palpation the soft palate was found to be much thickened. Extending upward into the nasopharynx on both sides were tumor masses about 2 cm. in length attached to the lateral pharyngeal walls with a broad base just in front of and below the eustachian tube orifices and completely blocking off these tubes. One of the nodules on the right anterior pillar was removed for microscopic study and a specimen of blood was taken. General physical examination by Dr. D. A. MacGregor was negative. Roentgenograms of the chest were negative. The temperature was normal.

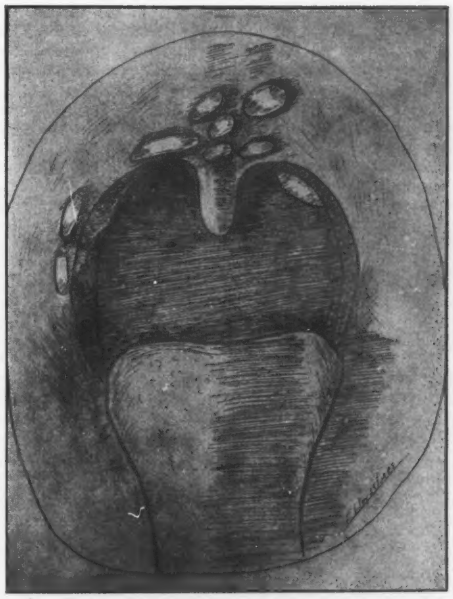

Fig. 1
Drawing of the throat as seen in November, 1924.

The blood Wassermann was reported one plus, but tissue examination revealed nothing suggestive of syphilis or tuberculosis. Dr. W. M. Sheppe, the pathologist, felt that this was a low grade chronic inflammation such as is produced by a foreign body or other mild but constant irritant.

Progress.—In view of the blood report the patient was placed upon vigorous anti-syphilitic treatment: neo-arsphenamin weekly, mercury by inunction and increasing doses of iodids. After three weeks of this treatment, the nodules became very tender, one in the center of the soft palate ulcerated, first as two pinpoint openings, which rapidly enlarged and penetrated the palate. Smears and cultures on blood agar showed a few staphylococci and no organisms of Vincent. A blood Wassermann at this time was negative as were subsequent tests taken at intervals of three months for the following two years. By the end of December the uvula and central half of the soft palate were missing. The edges of the ulceration were composed of granulation tissue over the surface of which was much thick, glairy, tenacious mucoid material with occasional yellowish specks which appeared to be pus. There was no odor and no bone necrosis.

In February, 1925, tissue was again removed from the edges of the ulceration for study. This report stated that numerous large cells were seen, the nuclei of

which stained deeply. A section from this tissue was sent to Dr. Ewing, of the Cornell Medical School, for his opinion as to the neoplastic nature of the lesion. Dr. Ewing stated that it was not malignant in character, but that it was some form of granulomatous tissue.

At this time it was suggested that a consultation be held. Accordingly the patient was seen by three otolaryngologists, Drs. Fawcett, Hoge and Zuback, and one dermatologist, Dr. Howard Phillips. The opinions were equally divided as to the lesion's being carcinoma or lupus. In lieu of nothing more definite, the lesion was considered as lupus and ultra-violet rays were applied. Slight improvement was noted in the course of a month over the anterior part where the lesion was superficial. But as no progress was seen in the nodules in the nasopharynx, the patient was admitted to the hospital for thorough cauterization of the area. This was done in March, 1925, after first removing as much of the masses as possible surgically. These pieces were sent to the laboratory for study. The report of this examination stated that there were peculiar types of cells noted beneath the mucous membrane, and there was no definite evidence of syphilis, tuberculosis or

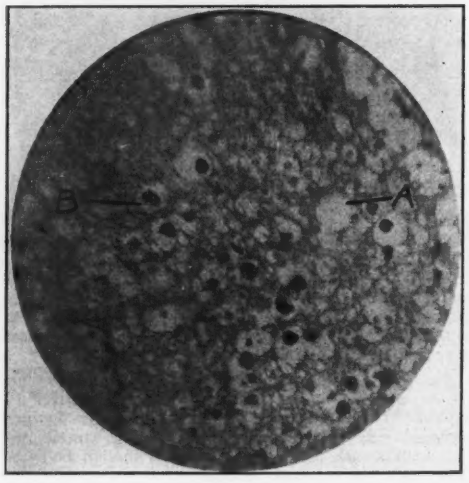

Fig. 2

Photomicrograph of the tissue. A, large clear zone within capsule and the retraction band extending toward the center; B, budding yeast cells.

carcinoma (*Fig. 2*). While he was still in the hospital two weeks later headache, fever and earache made their appearance. The ear drums were incised and much mucoid material mixed with pus drained for two weeks. The spinal fluid was entirely negative at this time.

April 5, 1925, after six successive daily specimens of sputum were negative for tubercle bacilli, it was reported that yeast cells were noted in each specimen. Cultures were then made on lactic acid glucose agar. Round, sharply circumscribed, yellowish gray colonies developed in thirty-six hours. The surface was smoothly contoured, moist and glistening. Smears showed round and ovoid yeast cells freely budding. No spores or mycelia were noted at this time, or at any subsequent time. The cell structure varied from four to nineteen microns in diameter. The buds often equalled in size the parent cell. The cytoplasm stained lightly with Loeffler's methylene blue. Polychromatic and dark blue granules were scattered irregularly in the cell. There was no evidence of ascospores or chlamydospores. No fermentation was produced in inulin, lactose or sucrose. In glucose a faintly acid reaction was produced but no gas in forty-eight hours. The cultural characteristics identified this yeast as torula: it reproduced by budding, did not form spores, did not produce mycelia or hyphae and did not ferment sugars. Considering that these yeast cells might be a saprophytic surface infection, we made an uncontaminated culture of the living tissues by cleansing the surface of one of the nodules and after incising the surface, taking scrapings with a curette for culture. The organism above noted was grown in pure culture. Cultures were made from the aural discharge, which showed staphylococci and the same yeast cells. White rats were inoculated intraperitoneally with the yeast cells. Autopsy on them three months later revealed small white nodules in the kidney parenchyma, from which pure cultures of the organism were obtained. The gelatinous capsule was very distinct in these cultures. The brain, liver and lungs were entirely negative.

By May, the palate had entirely healed so that there were no granulations present. Nodules considerably reduced were still present in the nasopharynx, but they did not appear to be active. There was still present the mucoid discharge (*Fig. 3*). The ears had returned

Fig. 3

Photograph of the lesion taken during the quiescent period, July, 1925.

to normal. The patient gained ten pounds in weight and felt well except for the defect in speech from the loss of tissue in the palate.

In December, 1925, the left eustachain tube closed and the left side of the palate became tender. The patient was put on saturated solution of potassium iodid, and the dose was gradually increased up to one dram three times a day. There was less tenderness,

but the nodules did not decrease in size. On five occasions between January and May, 1926, the nodules were removed and the bases cauterized only to reappear. There was little effort at healing, but nodules appeared where there had been none. The iodids were discontinued and the roentgen ray applied in dosage to stimulate fibrous tissue formation. There have been no cauterizations in the past seven months. The nodules have all disappeared from the margins of the palate and in the nasopharynx. The mucoid discharge has ceased. The lesion at present is entirely healed as far as can be determined by clinical examination. I have considered it as arrested, at least until more time has elapsed.

The patient presented a problem in diagnosis. Since the blood Wassermann was slightly positive and while we were awaiting the report of the tissue examination the lesion was provisionally considered as syphilitic. The rapid breaking down under anti-syphilitic treatment, and the report of the biopsy ruling out syphilis and carcinoma, made this diagnosis untenable. The pathologist was uncertain about tuberculosis or lupus. Hence the lesion was considered as lupus, although it had not all its characteristics. The rapid necrosis following the use of the iodids made the diagnosis of lupus more likely. With this as the second provisional diagnosis, ultraviolet radiation and cauterization were carried out. The final diagnosis was not made until April 5, 1925, when the pathogenic yeast, torula, was cultured on lactic acid agar. On reviewing the tissues microscopically the unusual cells taken for lymphocytes were identified as yeast cells surrounded by a gelatinous capsule. The yeast cells in the cerebrospinal fluid from many of the reported cases have been mistaken for lymphocytes or erythrocytes.

COLLECTED CASES OF TORULA INFECTION

Authors	Cases	Diagnosis made	Organs chiefly involved	Probable Atria	Serology	End Results
Brewer and Wood	1	Cultured Pus	Vertebral Muscle			Recovered (Excision)
Pierson[4]	1	P. M.	C.N.S.			Fatal
Stoddard and Cutler	2	P. M.	C.N.S.	Pharynx - Yeast + A.S. Otitis Media	S.F. Neg + Wass -	Fatal
Rusk	2	P. M.	C.N.S. & Lungs C.N.S.		Noguchi +	Fatal
Türck	1	P. M.	C.N.S.	Esophagus and throat - yeast +		Fatal
von Hansemann[5]	1	P. M.	C.N.S.			Fatal
Evans	2	A.M.	C.N.S.	Naso-pharynx + Enlarged Cervical Glands	S.F. Noguchi +	Fatal
Freeman & Weidman	1	A.M.	C.N.S.	Tonsillitis		Fatal
Sheppe	2	A.M. P.M.	Lungs C.N.S.	Tonsillitis		Fatal
Bettin	1	A.M.	C.N.S.	A.S.O.M.		Fatal
Shapiro and Neal	1	A.M.	C.N.S.			Fatal
Hansmann	1	P.M.	C.N.S.		S.F. Colloidal - Lactic C	Fatal
Lynch and Rose	1	A.M.	C.N.S.	Pharynx - yeast + (not Torula)	Wassermann -	Fatal
Wilhelmj	1	P.M.	C.N.S.	A.S.O.M. Sinus thrombosis	"	Fatal
McGhee & Mickelson	1	Cultured Pus	Pelvic Tumor Abscess	Cervix	"	Recovered (Iodides)
Rappaport & Kaplan	1	A.M.	C.N.S. & Lungs	Pharynx + Acute Lung Sphenoid +	Blood Culture +	Fatal
McKendree & Cornwall	1	A.M.(?)	C.N.S.	Repeated pharyngitis	Wassermann -	Fatal
Jones	1	Cultured Pus	Palate and Naso-pharynx	Tonsillitis	Wass-Kolmer +	Arrested
Total	22	10 P.M. 8 A.M. 5	C.N.S. - 18			Fatal - 18

Fig. 4
Table of collected cases

HISTORICAL

The pathogenic yeasts were first brought to the attention of the medical profession in 1896 when Gilchrist[2] described the cause of a certain type of dermatitis as due to a yeast termed blastomycete. It was not until 1916 that Stoddard and Cutler[3] reviewed all the cases of so-called blastomycosis and isolated four cases and added two of their own, in all of which, according to the pathology and bacteriology described, they felt that the yeast, torula, was the causative organism. Since then the cases have been more frequently reported (*Fig. 4*).

Atria.—It is not my purpose to review these cases in detail, as they all had the chief lesion elsewhere than in the upper air and food passages. It is important, however, to note the frequency with which the central nervous system and lung cases were preceded by infections in the ears and pharynx. Acute suppurative otitis media shortly preceded the intracranial symptoms in the cases of Stoddard and Cutler, Bettin[5] and Wilhelmj.[6] Tonsillitis preceded the grave lesions in the cases of Freeman and Wiedman,[7] Sheppe[9] and the case herein reported. A throat culture was positive in Turck's case,[10] which also showed at post-mortem a retro-pharyngeal abscess due to the torula. Nasal and nasopharyngeal smears were positive for torula in the cases of Stoddard and Cutler, Evans[11] and Rappaport and Kaplan,[12] the latter case having also a suppurative sphenoidal sinusitis due to this yeast. McKendree and Cornwall's case[13] had had repeated pharyngitis previous to intracranial lesions. In short, there were eleven out of the twenty-two cases which showed infection in the nose, throat or ears. In the meningeal cases of Lynch and Rose,[14] smears from the

oro-pharynx were negative as were also smears from the tonsils in the case of McGhee and Michelson,[15] which had a pelvic abscess due to torula, in which case the portal of entry was probably the cervix. In the other eleven cases no mention is made of studies of the nose or throat.

There have possibly been many cases of infection by pathogenic yeasts that have gone undiagnosed because the infection was mild. Hranova[16] cultured the torula from what appeared to be an ordinary case of tonsillitis. Tanner and Dack[17] stress this point when making smears and cultures from cases that appear to be diphtheria. They found numerous pathogenic yeasts in such cases and no Klebs-Loeffler bacilli. Sheppe presumes that all the cerebral cases were infected through the cribriform plate, which also presumes a previous infection in the nose or throat.

There is no doubt that the organism has a predilection for the nervous tissue as evidenced by the predominance of the central nervous lesions. More than one strain of organisms which answer to the cultural characteristics of torula are known. Alvarez[18] reported very recently a hypertrophic condition of the papillae of the tongue which was due to a red torula. It is likely then that there are strains which have an affinity for the central nervous system and others that have not. McGhee and Michelson suggest two types of infection by the torula: (a) the systemic type involving the central nervous system primarily as evidenced by the great number reported; and (b) the local type as shown by their case of pelvic abscess, and by the case of Brewer and Wood,[19] which had an abscess of the vertebral muscles, both of which were the only cases which did not prove fatal. To this latter group might be added the present case.

An allied condition, oidiomycosis (blastomycosis), also is seen in systemic forms, pulmonary and cerebral and in local types. Dennis,[20] in 1918, reviewed the literature and found but two cases, including his own, in which a primary localized lesion was found in the upper air passages due to the oidiomycetes (blastomycetes). C. Jackson[21] has added one since.

Serology.—Reviewing the blood studies in the reported cases, it was noted that the blood Wassermann was positive in the second case of Stoddard and Cutler. The Noguchi was positive in Rusk's first case,[22] with a very indefinite history of syphilis. The spinal fluid in Evans' first case gave a positive Noguchi; Hansmann's case[23] produced a luetic colloidal gold curve. The present case produced a one-plus blood Wassermann by the Kolmer technic, which has since been persistently negative along with a negative spinal fluid. There is a danger in the weekly positive Wassermann as Mitchell[24] has recently mentioned. An error was made here in not repeating the blood test before treatment was begun. However, arsenic and iodids would have been good treatment, at least to be tried, had the diagnosis been known to be torula infection and not syphilis.

Differential Diagnosis.—The provisional diagnoses in the lung and brain cases were invariably some form of syphilis or tuberculosis. The organisms were found ante-mortem in some and post-mortem in others. The organisms so closely simulated lymphocytes that they were overlooked in several cases at first. The present case differs from all the others in that tissue containing the organisms was removed and examined. Here also the organism so closely simulated lymphocytes that the diagnosis was delayed. Cultural studies on acid media will produce pure colonies when there are contaminants present such as are found in the mouth. McGhee and Michelson suggest using a solution of sodium hydroxid on the unstained smear to remove the leukocytes. The yeast cells then stand out in marked contrast to the surrounding debris. Crowell in Jackson's paper recommends looking for the blastomycetes in the unstained section of the tissue.

In the tissue the lesions of oidiomycosis (blastomycosis) and coccidioidal granuloma resemble the lesions of torula. These must be differentiated by cultural studies. Torula measure from 2 to 10 microns in diameter, bud in tissue and in culture, never form hyphae or mycelia, never ferment sugars and never form ascospores.

Oidiomycetes (blastomycetes) are larger, ranging from three to twenty microns in diameter, reproduce by budding, grow mycelia in culture, ferment some of the sugars but never form ascospores.

Coccidioides are double-contoured likewise, but are still larger, ranging from three to sixty microns in diameter, never reproduce by budding but sporulate in the tissue and in culture, grow hyphae in culture and ferment sugars.

Clinically the lesion in the throat must be differentiated from the lesions of syphilis, tuberculosis, lupus and carcinoma.

The gumma is usually solitary, not painful, hard, breaks down and is accompanied by bone necrosis and foul odor; and heals with much scar tissue. Evidences of syphilis are found elsewhere, the Wassermann is strongly positive and recovery is rapid under anti-syphilitic treatment.

Tuberculosis as a primary lesion in this location is rare. It usually starts as a surface lesion, except in the miliary type. It is secondary to grave pulmonary lesions, painful, accompanied by edema and a wide zone of inflammation, does not respond well to local measures, progresses rapidly. Smears and guinea pig inoculation tests are positive, and the tuberculin test, if made, shows a local exacerbation.

Lupus is usually secondary to a skin lesion about the face. It occurs commonly in the young, is very indolent, healing in one place and breaking down in another, superficial always, painless and covered by a characteristic exudate. It heals with characteristic scar formation and responds in a measure to local treatment.

Carcinoma is solitary, appears in advanced age, starts as a surface ulceration, is due often to an irritant, and is accompanied by glandular involvement and fixation of the lesion. There is a foul odor and the condition is moderately painful. Local treatment short of radical surgery is of little avail.

Biopsy should be the means of differentiating all of the lesions and most certainly carcinoma.

Treatment.—The treatment of the cases has been more or less experimental. Shapiro and Neal[25] in the cultural studies found acriflavin most potent in killing the organism in the test tube. Where the organism can be reached this may prove useful. The ultra-violet rays assisted by the cautery made great improvement in the surface of the palate in this case, but to reach the organisms beneath the surface was a more difficult problem. Iodids were used but with apparently no success. Dr. Kalbfleisch, our roentgenologist, suggested the roentgen ray with the thought of stimulating fibrous tissue formation. This has apparently been more beneficial than any of the previous treatments.

SUMMARY

The case reported is that of a destructive lesion in the palate and nasopharynx due to the yeast, torula, and at present is in an arrested condition.

Lesions by this yeast are rare, most commonly occurring in the central nervous system, and are preceded by similar infections in the nose or throat.

The organism must be differentiated from the oidiomycetes and coccidioides by cultural studies and the gross lesion from lesions of syphilis, tuberculosis and carcinoma by biopsy when possible.

Nothing definite has been shown in the way of treatment. Roentgen rays are given credit for arresting the present case.

Note.—The author is indebted to Dr. W. M. Sheppe for all the laboratory studies, for the final diagnosis and for valuable assistance in securing the literature upon this organism.

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DISCUSSION (Abstract)

Dr. J. M. Woodson, Temple, Texas.—It is remarkable that in many of these cases the brain and central nervous system only were affected, and there was nothing in the blood or temperature to indicate the nature of the infection. In McGhee and Michelson's cases the blood count ran from 10,000 to 34,000 leucocytes and the temperature was 101 to 103°. In Dr. Jones' cases the leucocyte count was only about 7,000 and there was no temperature. The ear complications seem to have been altogether of an obscure character and possibly had nothing to do with the specific infection.

Torulae have been found in tumors in which they were not suspected, and the question arises whether the torula is the exciting cause, or whether the nature of the tumor has been so altered by the presence of the torula that the real pathology cannot be demonstrated. If the brain is to become involved by an infection like this, it should occur when the infection is as Dr. Jones described, in the nasopharynx and the nose.

Dr. Dunbar Roy, Atlanta, Ga.—How was the x-ray used and applied?

In the last two years we have been treating cases of Vincent's angina, and even ulcerated tonsillitis and follicular tonsillitis, and various other conditions, and especially eczema of the external ear, with x-ray, 4 to 8 inch gap, with about 3 mm. of aluminum screen at a distance of 17 to 18 inches, and about 8 milliamperes. We have been surprised at the results we have gotten in Vincent's angina and in ulcerated conditions in the mouth by applying the ray directly upon the lesion.

The roentgen ray inside the mouth in ulcerated conditions is exceedingly beneficial and has given me results which I have never obtained otherwise.

Dr. William D. Gill, San Antonio, Texas.—Within the past six months two patients have entered the Eye, Ear, Nose and Throat Clinic at Fort Sam Houston, with lesions due to the *Torula histolytica*. The first, a white man, age 26, had an ulcerative cutaneous lesion in the preauricular region on each side of the face, which, according to his statement, had been present for twenty years, and had at intervals during that time been subjected to a variety of different treatments without effecting a cure. The treatment we employed consisted of the oral administration of potassium iodid and gentle curettage of the lesions followed immediately with the x-ray. The lesions yielded promptly to this form of treatment and in six weeks were entirely healed.

The second was a white girl, age 12, who for two years and nine months immediately preceding the onset of her illness, had lived in the Hawaiian Islands. She had been a frequent sufferer with styes. Three days before her initial visit to the Clinic she developed an edema of the lids of the right eye and a moderate degree of proptosis. An x-ray made at the time of her first visit to the Clinic showed the paranasal sinuses to be negative. A diagnosis of acute orbital abscess was made and confirmed by operation, about half an ounce of thick brownish pus being evacuated. Six days after this operation the x-ray showed the right anterior ethmoid cells and the right maxillary antrum to be involved. Because of the child's critical condition, these sinuses were opened. Until this time the *Torula histolytica* was constantly present in the blood stream. The white blood count averaged around 25,000 during the first two weeks of the patient's illness, polymorphonuclear neutrophils predominating, and the temperature fluctuated between 101 and 103 degrees. Late in the illness the patient developed a mild secondary anemia. The treatment for the torula infection consisted in irrigation of the orbital wound and the operated sinuses with dilute iodin solution, the oral administration of potassium iodid 120 grains daily, the intravenous administration of sodium iodid 15 grains daily, and x-ray therapy to the orbit and sinuses at intervals in an effort to limit sporulation of the organisms. A close watch has been made in this case for evidence of pulmonary or central nervous system involvement, but so far neither have occurred. The patient has now practically recovered except for a small lesion on the lower lid of the right eye near the nose. The mechanism concerned in the production of torula infection of the central nervous system is perhaps similar to that concerned in epidemic cerebrospinal meningitis, the primary focus being in the upper respiratory tract, a bacteremia arising from this focus, with subsequent localization of the organisms in the central nervous system. Early diagnosis is of paramount importance if we are to prevent extension to the central nervous system by way of the blood stream. We are, of course, dependent upon the bacteriologist for the identification of the *Torula histolytica* in the lesions. I would sound a warning note against biopsy for diagnostic purposes, as little can be learned from it, and it carries the potential danger of breaking down the restraining wall of leucocytes and facilitating extension to the central nervous system by way of the blood stream.

Dr. Jones (closing).—I wish to thank Dr. Gill for reporting these cases. I hope he will report them as torula and not blastomycosis.

The treatment consisted of both soft and hard rays. The soft rays were directed into the mouth: one-fourth skin erythema dose, 6 inch gap, 5 milliamperes, no filter at 20 inch distance. This dose was repeated three times during a period of six weeks.

The harder radiation was given from each side of the neck, one week apart. The dosage for each field 3 inch by 3 inch area was 1-5 skin erythema dose, 140 kilovolts, 5 milliamperes, 20 inch distance and using 0.5 mm. copper plus 1.0 mm. aluminum as filter.

ROENTGEN-RAY FINDINGS IN CHESTS OF ASTHMA PATIENTS*

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and
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The wealth of literature which has appeared on bronchial asthma in recent years contains relatively few articles upon the pathological findings in that disease and less upon the roentgen-ray findings. This is not remarkable in view of the striking advances in the field of allergic phenomena. However, there is a fairly large

*Read in Section on Radiology, Southern Medical Association, Twentieth Annual Meeting, Atlanta, Georgia, November 15-18, 1926.

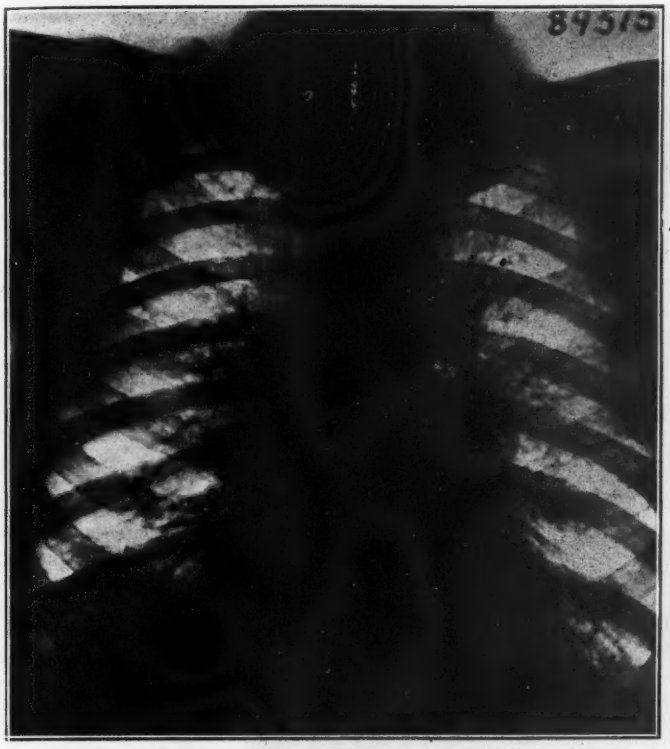

Fig. 1. General peribronchial thickening.

percentage of cases which are not protein sensitive or which fail to respond to desensitization procedures.

Clinical study has revealed a number of associated and apparently causative conditions within the chests of patients suffering with bronchial asthma. Blumgarten[1] states that a careful study of so-called idiopathic asthma will reveal in a great many cases some underlying organic lesion hidden under the physical signs of asthmatic attacks. He illustrates his statement with cases in which he has found bronchial asthma secondary to aneurysm of the aorta, carcinoma of the lungs, myocardial insufficiency, generalized arteriosclerosis and pulmonary tuberculosis. The patient who had carcinoma of the lungs had been treated for ten months for asthma. Huber and Koessler[2] also mention a case of carcinoma of the lung with asthmatic symptoms. Rackeman[3] cites a patient who was referred to him for asthma who had a tumor, probably luetic in nature, which, arising in the bronchial mucous membrane, was large enough to obstruct breathing. In the same study he found one with lung abscess. Kamchorn and Ellis,[4] while drawing the conclusion that "the histology of the bronchi does not explain the course of bronchial asthma," give autopsy findings in an asthmatic as follows:

"Left pleural cavity obliterated by adhesions. Left lung collapsed to one-half its normal size. Bronchial mucosa pale. Bronchioles desquamated, replaced by mononuclear leucocytes. Vessels intensely hyperemic. No evidence of fibrosis of the bronchial walls."

Bronchiectasis is mentioned as a concomitant of asthma by Harkavy[5] and Peshkin.[6]

Huber and Koessler[2] in a pathologic study of asthma make the statement that bacterial infection may lead to bronchial stenosis. This produces obstruction of the bronchi with accumulation of exudate, injury to the bronchial walls, and a long series of events leading to the introduction of allergic phenomena from the absorbed products of bacterial decomposition in the retained secretions. They examined six cases at autopsy, with the following findings:

"Thickened walls of the bronchial arteries, adhesive pleuritis, calcification and ossification of the bronchial cartilages, consolidated areas of pulmonary tissue, cellular infiltration of the bronchial walls, occlusion of the smaller bronchi by cellular exudate and hypertrophy of the mucous glands, and cellular infiltration of the bronchial walls."

Findings of enlarged tuberculous tracheobronchial glands are given by Peshkin and Fineman,[7] Peshkin[6] and Rackeman.[3] Peshkin and Fineman further state that this condition is probably commoner than one is led to believe from the American literature.

Some form of pulmonary tuberculosis is frequently mentioned.[1 8 9 10 11] Ratner[12] describes two cases of general miliary tuberculosis in which asthmatic attacks were striking symptoms.

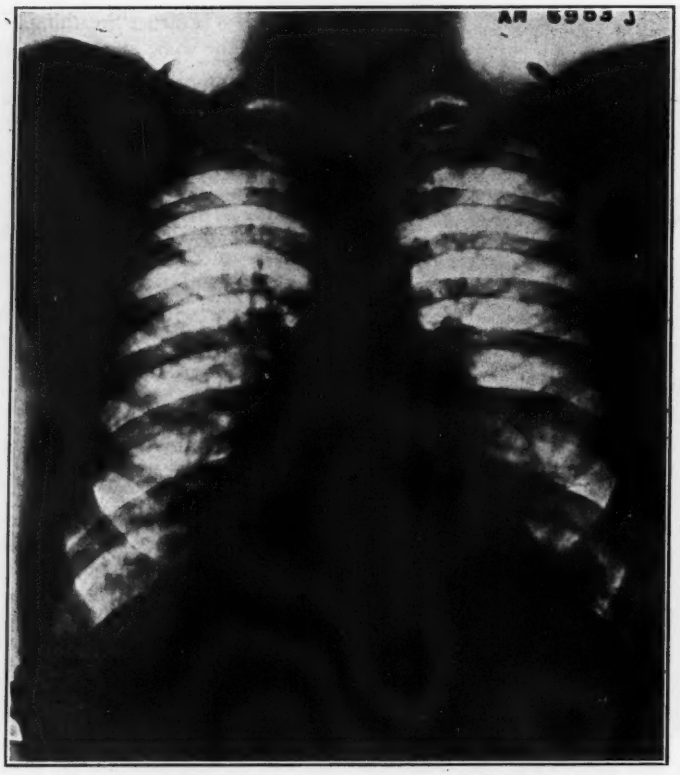

Fig. 2. Chronic infections process, both lower lobes, bronchiectasis.

Both cases presented tracheo-bronchial glands enlarged to such an extent that they obstructed breathing. Rackeman, out of six hundred and forty-eight cases, found eleven with chronic pulmonary tuberculosis.

A number of writers indicate that the onset of the asthma followed an acute respiratory infection, of which many were influenzal.[5] Seventeen of Rackeman's[3] series of six hundred and forty-eight fall in this class. Stirling[13] in a series of eighty found thirteen to have had such an onset. Chant[14] gives 35 per cent as having had pleurisy or pneumonia previous to the onset of asthma; Buffalini,[11] fifteen in a series of twenty-two.

Crouch and Forney[15] describe thirteen cases of asthmatic bronchitis examined by x-ray, all of which presented increased bronchial shadows, hilus thickened on one or both sides, mediastinum broadened and several with a notch on the aortic arch. Of these thirteen, one had aneurysm, two tuberculosis, two cardiac disease, in addition to the asthma. Harkavy presents nine cases, all of which showed unresolved pneumonia in one or both lower lobes. He believes that unresolved pneumonia is much more common than is supposed.

We were led to take an interest in this subject, first, from the fact that a great many patients were coming to the x-ray department with a clinical diagnosis and history of asthma; second, because a large percentage of these cases showed definite evidence of organic lesion in some portion of the thorax; third, because an appreciable number of foreign body cases have been treated at one time or another for asthma; and fourth, for the reason that we have not found a sufficient amount of attention given to the subject in the x-ray literature of the last decade.

Our present report is not only a preliminary report, but is limited to the study of the thorax, even though many of the cases studied had radiographic evidence of disease in other parts of the body, such as dental infections, sinus or mastoid disease, etc. We are not attempting to demonstrate a new method of making a diagnosis of asthma, nor even assuming in the least any controversial attitude with regard to the question as to whether asthma is a disease or a symptom complex, or the cause or effect of the lesions we find. Rather it is our desire to record the radiographic findings, as we see them, in a considerable group of cases, and to stimulate the interest of radiologists and clinicians in the subject. If radiographic study is not an essential aid to the diagnosis of asthma, the symptom complex, we feel that it is a very definite help in determining the presence, absence or extent of organic disease that may have a very definite influence on the number and

severity of the asthmatic attacks, and lead to a beneficial plan of treatment. Also the radiologic study is of great value in making a reasonably accurate ante-mortem classification.

Then, too, some acute infectious disease is so frequently an etiological factor that we should anticipate or expect that radiographic study would be of value to show the complications and sequelae that are frequently associated with acute infectious disease in the lung.

The cases included in this study are made up of two groups. In *group one* are the patients who came from the Department for Diseases of the Chest, from the Medical Dispensary, and many of them from Dr. Jackson's Bronchoscopic Clinic, which were not foreign body cases. *Group one* also includes forty cases which were sent from the Asthma Clinic, because there were physical signs suggestive of organic disease.

Fig. 3. Tuberculosis, upper lobes, probably inactive.

Group two came from the Asthma Clinic at our request, and we asked especially for patients in whom there were no physical signs of organic disease, or in whom the Clinic would expect no diagnostic aid from the ray examination.

In *group one*, of eighty-eight cases, the radiographic findings were as follows:

(1) General peribronchial thickening	24-27 per cent
(2) Chronic lower lobe infection (including diaphragm adhesions)	29-33 per cent
(3) Tuberculosis	16-18 per cent
(4) Heavy root structures	13-15 per cent
(5) No radiographic evidence of disease	6- 7 per cent

In *group two*, the radiographic findings were as follows:

(1) General peribronchial thickening	18-26 per cent
(2) Chronic lower lobe infection	7-10 per cent
(3) Tuberculosis	12-16 per cent
(4) Thickened root structures	6- 9 per cent
(5) Enlarged heart	5- 7 per cent
(6) Emphysema	2- 3 per cent
(7) No findings	19-28 per cent

Taking the two groups, the findings are as follows:

General peribronchial thickening	42-27 per cent
Chronic lower lobe infection	36-23 per cent
Tuberculosis	28-18 per cent
Root changes	19-12 per cent
Enlarged heart	5- 3 per cent
Emphysema	2- 1 per cent
No findings	25-16 per cent

While a comparison of these two groups is somewhat interesting, yet it must not be taken as an index of diagnostic precision from the viewpoint of physical diagnosis, clinical diagnosis, or radiographic diagnosis. And it must be emphasized that the radiographic findings are not in any sense or degree an index to or an indication of the allergic phenomena which, after all, is the most important consideration for the patient who has the true classical asthmatic attack. On the other hand, there are many cases in which the dyspnea and attacks resemble true asthma so closely as to lead to a clinical diag-

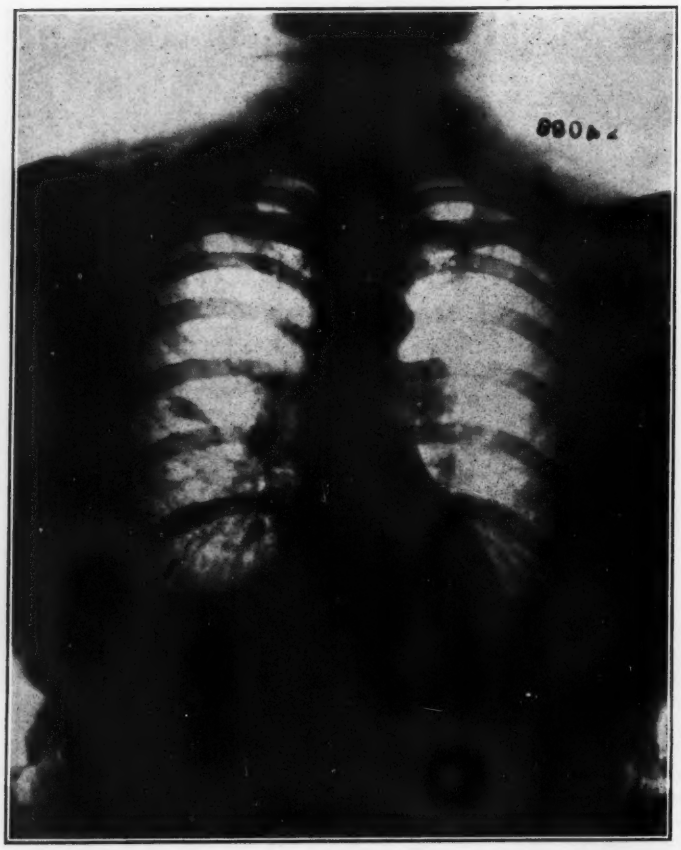

Fig. 4. Heavy root structures.

nosis of asthma, and this prevents further effort which might lead to organic diagnosis and successful treatment. This has been many times the case in patients having bronchial or esophageal foreign bodies. Then, too, it is probable, as Huber and Koessler[2] believe, that the absorbed products of bacterial decomposition may be the cause of the allergic phenomena, so that for many reasons the radiographic diagnostic information should be considered valuable.

We must now qualify and describe the radiographic evidences of disease that we have listed. In doing so, we admit that many of you might classify our cases differently. It is conceivable that the percentages might vary greatly, especially in the cases which show general peribronchial thickening, root thickening, or even in the cases that we have listed as tuberculous. Radiographic interpretation is to a great extent an individual reaction. This sort of personal variation is found in others of the precise branches of medical science. But we believe that any or all of you would admit the evidence of some sort of disease or tissue change in all of the cases we have listed as showing organic change, and you might include among these some of the cases that we have listed among those showing no radiographic evidence of disease.

(*Fig. 1*). General peribronchial thickening is a condition in which the radiographic shadows of the bronchi are increased in length, thickness and density throughout the entire chest. The distribution is even. There may or may not be marked thickening at the roots of the lungs. The bronchi are not straightened out and rigid in appearance, as we commonly see them in cases of peribronchial tuberculosis where fibrosis becomes well established. The parenchymal portions of the lungs are usually clear. Many of us have associated this appearance with chronic bronchitis, which it is, rather than with asthma, which may also be present.

(*Fig. 2*). Chronic infection in the lower lobes includes adhesions involving the diaphragm on one or both sides. In the vast majority of these, there is a more or less extensive bronchiectasis and in others destruction of lung tissue and fibrosis. Diaphragmatic adhesions vary in extent. This series does not include proven foreign body cases, but we believe that more than a few of them are of the aspiration infection type. The list might have been greatly enlarged if we had included all the foreign body cases that, at one time or other, had a diagnosis of asthma.

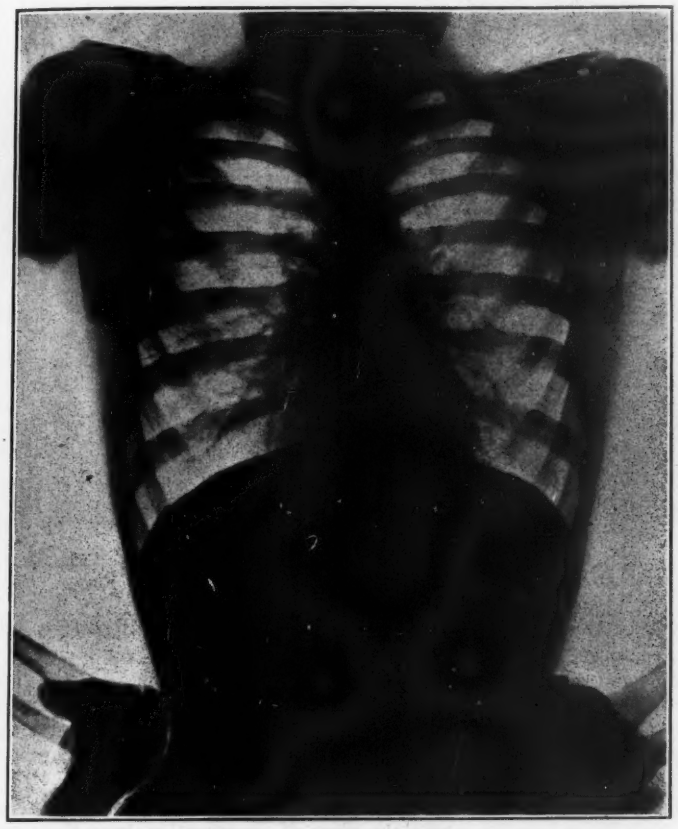

Fig. 5. Emphysema. Chest is barrel-shaped.

There are a number of obstacles in the way of easy interpretation of radiographic shadows in the lower chest. Many of the asthma cases are short and stout, or, at least, stout, with thick chest walls, high diaphragms and transverse hearts, and added to these, in the female, the breast tissues help to make good radiographic results difficult. In some cases the heart action is sufficiently violent to move the lung tissue near it and cause a blur in the shadows. In other cases the lesion is mostly behind the heart and obscured by its shadow. In cases with marked ptosis of the diaphragm and vertical heart, one sees an increased amount of bronchial shadow and may be misled. And then there is quite a variation in the normal in this region.

The radiographic evidence of bronchiectasis was described and classified very well by A. B. Moore[17] some years ago. One is justified in making such a diagnosis from the presence of small masses of exudate and heavy bronchial shadows. In some instances[19] one actually sees evidence of small or larger cavities. And now, by means of the injection of iodized oil, after the aspiration of exudate through the bronchoscope, one is able to demonstrate the actual extent of the lesion. In fact, most of the conditions that we demonstrate radiographically can be seen also by direct vision through the bronchoscope.

(*Fig. 3*). It is hardly necessary for me to describe here the radiographic evidence of tuberculosis shown in these cases. We must say, however, that in some of the cases the involvement was slight and apparently completely healed. In others the lesion, though very extensive, was either not recognized clinically or was thought to be of minor importance. In a few instances there was evidence of tuberculosis in the apices, and a rather extensive bronchiectasis in the lower lobes. In one tuberculous case there was also a fairly advanced anthracosis.

(*Fig. 4*). Thickened root structures, as shown radiographically, are also variable in the normal, and we know that many persons have abnormally heavy root shadows without having asthma; but we believe that the same degree of radiographic enlargement and density in different patients may be associated with vastly different pressure or inflammatory effect. In some of the cases the thickening is due to glandular enlargement, while in others one gets the impression that there must be inflammatory thickening in the bronchial, peribronchial and periglandular tissues. It was difficult to classify some of this type because of associated general peribronchial thickening.

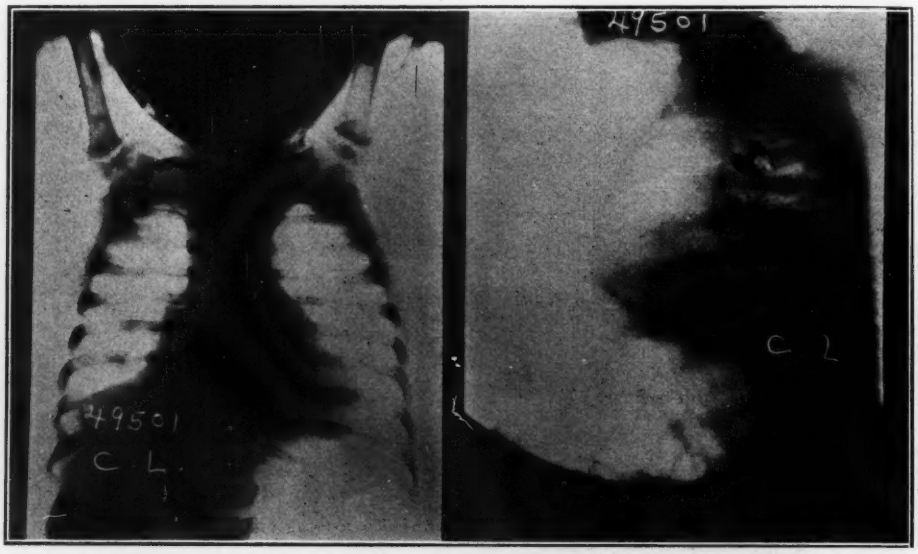

Fig. 6. Gold collar button in esophagus. Present about eight months. Treated many weeks for asthma. Collar button cut through esophagus into trachea, producing a fistula.

We have classed as enlarged heart only such cases as show at least a 25 per cent enlargement over the average normal, and we are not prepared to discuss the importance of the findings.

(*Fig. 5*). Many of the cases showed evidence of emphysema, but there were two in which there was no other sign.

Of the twenty-five cases which we class as negative findings, a number may later go into another class when we obtain better radiographs.

(*Fig. 6*). While we have not included foreign body cases in this series, it is of the utmost importance that we emphasize the frequent association between foreign body and the clinical diagnosis of asthma.

In 1918 Dr. Jackson[20] described the "asthmatoid wheeze" as a diagnostic sign of foreign body in the trachea and bronchi, and cited a number of cases in which the sign was present. We know that this sign alone has led to the erroneous diagnosis of asthma in many cases, and even in cases of foreign body in the esophagus where the foreign body had produced an esophago-tracheal fistula, or by peri-esophageal swelling caused narrowing of the tracheal lumen.

SUMMARY

Comparatively little has been reported concerning the roentgen ray study of patients suffering with asthma.

In a very large percentage of such patients, there are tissue changes that can be demonstrated by means of the roentgen ray, and this is the best source of information short of the autopsy table.

The roentgen ray study does not in any sense take the place of investigation from the viewpoint of allergy, or minimize the importance of this investigation.

The extent and character of tissue change or evidence of infection should be taken into consideration from the viewpoint of treatment.

The question of foreign body should be kept in mind, especially in children.

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DISCUSSION (Abstract)

Dr. Harry S. Bernton, Washington, D. C.—I should like to ask Dr. Manges how many of his cases were children. We have been led to believe that enlarged peribronchial lymph glands may cause obstruction to respiratory movement, and even a certain amount of wheezing. Nevertheless, in cases of malignancy of the lung or in Hodgkin's disease or in cases of aneurysm, when there is enough pathology in the chest to cause trouble, it is astonishing how rarely asthmatic symptoms are observed.

I am particularly interested in this phase of the question because many children with asthma are told to apply for x-ray treatment to reduce the glands. In early childhood there is a hyperplasia of the lymph nodes throughout the body.

I was very happy to hear what the Doctor said about the diagnosis and treatment of asthma from an x-ray standpoint. I do not agree with his interpretation of inspiration asthma. Are we to understand that foreign material, such as pollen grains, horse dander, or other animal emanations, are aspirated into the lung? Foreign bodies are usually retained in the nasal mucous membrane and are prevented from entering the lungs by ciliary activity. Our interpretation is that the material to which the asthmatic is sensitive is dissolved in the tissue juices of the nasal mucosa and that the solution, circulated by the blood stream, acts directly on the bronchial structure or indirectly through the central nervous system.

I do not believe that inspiration asthma is caused by bacteria. The disease is primarily a spasm of the smooth musculature which compresses the small veins and lymph yessels in the bronchioles. Consequently there is a transudate of serum and hypersecretion of the glands of the lining epithelium. This condition leads to a narrowing of the lumen of the air passages and to obstruction to the passage of air. Bacteria are as a rule found within the bronchiolar secretions which are eventually expectorated after great muscular effort. Convincing evidence that these bacteria are capable of producing bronchial spasm is still lacking. In malignant disease and in the various ulcerations of malignancy, bacteria are inevitably present. Does any one presume that these bacteria are the cause of malignancy? They are simply concomitants.

Dr. Ray M. Balyeat, Oklahoma City, Okla.—Very few people who develop their asthma in childhood become cases of open tuberculosis later in life. The cases of asthma associated with tuberculosis are usually found in people whose asthma began after they were twenty years of age. They are the cases whose protein hypersensitiveness developed after they were open cases of tuberculosis. Walker, of Boston, several years ago reported sixteen hundred cases of asthma with which he found associated only four cases of tuberculosis. Tuberculosis does not develop in cases of true asthma that begin in the first decade of life, because the lung is congested much of the time from the asthmatic condition, and under such conditions the tubercle bacilli do not live and thrive well. Dr. Manges reported 18 per cent of his cases as tuberculous. Were those 18 per cent actually open cases of tuberculosis with tubercle bacilli in the sputum, or were they considered tuberculous from an x-ray standpoint? I should also like to know whether these cases were well up in years when their asthma began, or whether it began in the first two decades of life.

Dr. J. H. Edmonson, Birmingham, Ala.—Very little is known of the pathology of asthma. As Dr. Manges says, the only investigation of any note has been by means of the x-ray. His paper emphasizes the accumulation within the lung from a mechanical standpoint as a causative factor in bronchial spasm. Secondarily, in the susceptible, the biochemical effect is manifested as an allergic reaction from absorption.

Dr. W. P. Whittington, Asheville, N. C.—Dr. Manges has demonstrated that there is a definite pathologic condition in almost every case of well developed asthma. This paper and other papers of members of the Association, it is hoped, will develop things of great importance in the study of asthma.

Dr. Manges (closing).—I did not read the brief survey of the literature which I have brought with me, but would like to refer to just one thought in it. Huber and Koessler in a pathologic study of asthma made the statement that bronchial infection may lead to asthma. They try to explain even the allergic phenomenon and true asthmatic syndrome on the basis of absorption from the infected area. That is my own impression, and is perhaps enough reason to warrant this study. Some form of pulmonary tuberculosis is frequently mentioned in asthma, and there are numerous references to it in the literature. Ratner describes two cases of general miliary tuberculosis in which asthmatic attacks were frequent. Those cases presented enlarged bronchial glands that obstructed breathing. Rackeman found eleven cases of asthma with pulmonary tuberculosis.

I cannot tell how many of my cases were children. I have not analyzed the group of patients from that point of view. I have tried to impress upon you that my only object in this paper is to show that there is radiographic evidence of changes in the tissues of the

chest in an extremely large number of asthmatic patients.

You have misunderstood me. There is no aspiration asthma. There are large numbers of patients who have aspiration infection. Food, dust, anything that goes down and does not come out will produce a mechanical irritation in which bacteria will thrive. That is what I meant by aspiration infection. We have one case without any history of a foreign body in which the radiograph was so typical that I voiced the opinion that there was a foreign body. Not until after the eighth treatment did the bronchoscopist see a tiny black spot and pull out a timothy head. When the infection is absolutely one-sided and at the base of the lung, then you ought to have some very strongly suggestive history to account for it, or suspect that there is a foreign body.

So I have not said aspiration asthma. I have said that many basal infections are aspirations, others are the result of pneumonia, others are the result of influenza. A large number of cases have asthmatic attacks following an acute infection, such as a cold, influenza or pneumonia. In fact, there is one small list of infections in which nearly all the asthmatic cases that were studied were unresolved pneumonia cases.

Dr. Balyeat said he felt that when children have asthma they rarely ever develop tuberculosis. That is possibly true. I did not show the group of tuberculous patients with the idea of demonstrating the cause of the asthmatic attacks. The patient may have had a healed tuberculosis before he contracted asthma. I merely showed that there is this change in the lung. If one pays attention only to the asthmatic syndrome, he is certainly not doing his best by his patient. Some cases may be very definitely active tuberculosis with bacilli in the sputum; others are not.

Perhaps some of my cases under certain circumstances would not finally be classed as asthmatic. I think it is fair for us to take in our study the patients who are being treated by reputable physicians for this disease and to accept them as clinical diagnoses. That I have done. Not all of these cases have come from the Asthma Clinic.

We hope from the radiographic study of large numbers of asthma cases to modify the treatment to benefit those who are suffering with chronic active infections and extensive tissue changes, who are not affected by allergic medication.

USE OF IODIZED OIL IN CHEST DIAGNOSIS*†

By J. J. SINGER, M.D.,
and
SHERWOOD MOORE, M.D.,
St. Louis, Mo.

Since the paper published by Sicard and Forestier,[1] in 1922, describing the use of iodized oil in pulmonary diagnosis, radiologists all over the world have become much interested in the procedure. Americans have been rather slow in adopting this method, but in Europe and South America so much good work has been done that its great value is established.

In this country Pritchard,[2] Ballon,[3] Jackson[4] and Iglauer,[5] among others, have published interesting observations on the use of this oil. For its introduction into the respiratory tract, several methods have been described. They are the following:

(1) After local anesthesia of the tissues over the trachea below the level of the thyroid cartilage, a needle-shaped trocar is introduced directly into the trachea. When the passage of air through the tube is noted, warm iodized oil is introduced under considerable pressure.

(2) Under direct laryngoscopic view, a tracheal catheter is introduced between the vocal cords after the pharynx and larynx have been made anesthetic by a 20 per cent solution of eucain and the oil is injected.

(3) Through the bronchoscope it is introduced directly into the lung, with anesthesia, the preparation being the same as for bronchoscopy.

(4) With preliminary morphin narcosis and local anesthesia of the pharynx, larynx and trachea under direct laryngoscopy, a catheter is introduced between the cords and the oil flows in.

(5) Iglauer uses an ingenious special intubation tube, so connected that there is a one-way flow of the oil.

(6) By far the simplest and easiest method of introducing the oil is that described by one of the authors (Singer[6]), suggested by the work of Lian.[7] No anesthesia of any kind is necessary in most cases, but in the nervous individual local anesthesia of the pharynx is helpful. The patient is placed on the affected side, with the tongue protruded as far as possible and held by means of a towel in the operator's hand. A straight cannula, attached to a Luer or Record syringe of 10 to 20 c.c. capacity, is introduced toward the base of the tongue (*Fig. 1*). When the tip has reached the lowest point possible, the oil is slowly discharged. It flows through the larynx into the trachea and thence into the bronchial tree. It is essential that the oil be at body temperature. A summary of instructions is appended.

In our experience, the presence of iodized oil in the respiratory tract is harmless. Such ill effects as may arise are to be attributed to the

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*Read in Section on Radiology, Southern Medical Association, Twentieth Annual Meeting, Atlanta, Georgia, November 15-18, 1926.

†From the Chest Service and X-Ray Department, Washington University School of Medicine.

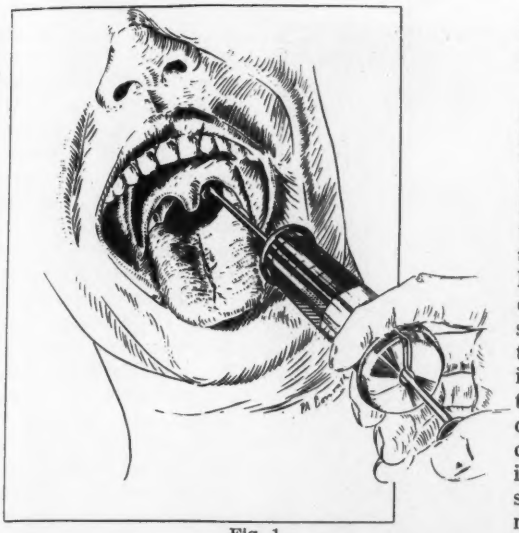

Fig. 1
Illustrating injection of lipiodol.

Fig. 2
R. S., taken May 28, 1926. Lipiodol injection into both lungs at the same time. Patient sitting upright. This shows a normal distribution.

method employed in its introduction. In our hands these are eliminated.

The question naturally arises as to the danger of iodism occurring subsequent to the employment of bronchography. In the respiratory tract it seems that the iodin and oil are too closely combined chemically to allow the freeing of a sufficient amount of the former to give rise to either local or general symptoms. In the alimentary tract, on the other hand, this is not the case. Through digestion, enough iodin is freed for iodism to follow, should the oil be present in sufficient quantity. With our system of administration, iodized oil may and occasionally does enter the stomach. Its presence there is promptly detected because of the immediate x-ray procedure. When the opaque oil is found there, if voluntary emesis is impractical, resort should be had either to lavage or to the administration of a large dose of castor oil. In our experience, however, iodized oil has frequently found its way into the stomach, and there has never been any effect from it. The question is dealt with because of its theoretical rather than its practical import.

The use of iodized oil in bronchography closely parallels the employment of opaque artificial contrast media in the study of hollow structures, whether natural or acquired. Any differences that may exist are to be ascribed to the particular anatomical nature of the respiratory tract, and in no sense to any fundamental divergence of underlying principles. Applied to hollow structures, contrast media are capable of demonstrating the following: size, form, outline and space relations.

For practical purposes the respiratory tract may be described as a compound system of tubes with blind terminations. It is therefore particularly

Fig. 3

I. B., taken January 14, 1926. Shows bronchiectatic lower lobe filled with lipiodol, while middle and upper lobes show normal bronchi. At point of the double arrow is the line of the lung showing compression by pneumothorax.

suited to study in relation to the physical factors enumerated. In the normal subject (*Fig. 2*), bronchography outlines the trachea, its bifurcation, the main bronchus, and in descending scale in size, the tubes and their branching, until the limit of visibility is reached. The appearance of the tubes is so sharp as to resemble closely a cast. Shortly after the iodized oil has reached the lesser tubes, or, if coughing or other sudden increase of intrabronchial pressure occurs, the invisible lung spaces, bronchioles, and possibly alveoli, fill and there takes place a phenomenon which may be called dispersion. The result is a diffuse, poorly defined area of density presenting no detail. This is possibly a localized "drowning." Such areas clear in a short time, and they have originated no ill effects. Despite this, however, iodized oil or any other liquid should be limited as to quantity if instilled deeply into the lung. For this reason, and the additional one of avoiding excessive superimposition of dense bronchial tubes, which renders interpretation difficult, it is desirable to study the lungs in detail. Not only each lung is to be examined separately, but also each lobe, lower, upper and middle. In fact, the disposition of the main bronchi and gravity enforces this method.

With the subject sitting erect, the iodized oil flows into the right bronchus rather than the left. Should the reverse be found, there exists an abnormality of the left main bronchus, an explanation of which is to be sought. Generally in this position there is enough flow of the oil into the medial descending bronchial branches to visualize them equally on the two sides. For investigation of the lower lobe on one side, the patient is inclined to that side, so that its main bronchus is assured of being lower than its fellow. If the middle lobe is to be investigated, the subject lies horizontally. The upper bronchial branches are delineated by instillation with the subject lying on the side; when the necessary amount of oil has reached the trachea, the head is lowered. For obvious reasons, the filling of the upper lobe tubes is never so satisfactory or complete as the lower.

The inflow of iodized oil should be observed fluoroscopically. Since for complete study films are necessary in bronchography, the observation is to be carried out rapidly in order that dispersion may not take place before they are made. It is best that not more than ten minutes elapse between the ingress of the oil and the

Fig. 4

J. T., taken February 17, 1926. Shows the right lung mapped out by iodized oil, with a negative shadow which is interpreted as pulmonary tissue without open bronchi (inflammatory tissue).

making of the film. It is scarcely necessary to state that a preliminary film is essential.

Bronchography with iodized oil delineates more or less perfectly the physical factors mentioned above, as they are related to the normal bronchial tree. It follows that deviations from the normal are equally well demonstrated. This leads to a consideration of those pathological conditions that may have their effect on the bronchial tubes. The origin of these may be intrinsic or external and remote. In our material, the pathological conditions in which this method supplied the greatest aid in diagnosis were, in the order of their frequency and usefulness, the following: bronchiectasis, pulmonary abscess, pulmonary tumor, pulmonary tuberculosis, pneumothorax, fistulous tracts, and as an adjunct to therapeutic measures.

Bronchiectasis.—Nothing of greater value in the study of this condition has ever been added to our diagnostic armamentarium. Where formerly reliance was placed on radiographs presenting infiltrations of varying degrees, sizes and distribution, wholly lacking characteristics, and often concealed by the heart or other density, we now have with this method striking and conclusive findings on x-ray examination (*Fig. 3*). Not only can the presence of bronchiectasis be determined, but also its extent, distribution and type. With this information at hand, the decision as to choice of treatment, surgical or otherwise, can be made with certainty.

Pulmonary Abscess.—Unless there exists liquefication and a bronchial fistula permitting some degree of evacuation of its contents, the determination of the presence of lung abscess by radiography is impossible. Contributory to this difficulty is the surrounding zone of pneumonitis or a pleural thickening, or additional abscesses. Furthermore, abscess may be of greater size than is commonly supposed, involving at times almost a complete lung. Bronchography under these conditions reveals distortion, occlusion, displacement of the tubes, or oil collection in a cavity (*Fig. 4*). From any combination of these findings, the existence of abscess may be deduced with a high degree of accuracy. In the presence of a bronchial fistula, an attempt at emptying by postural drainage should precede bronchography.

Pulmonary Tumor.—The findings here are similar to those in abscess. This is especially true after ulceration, breaking down, and infection have taken place (*Fig. 5*). Before that period accurate conclusions may more readily be drawn from the combination of dislocation or occlusion with a sharply defined outline.

Fig. 5

J. W., taken September 4, 1926. Shows bronchial markings through a dense shadow, which has been diagnosed aneurysm. Note the bronchial tree is not displaced or distorted. This is evidence of a mediastinal shadow, apparently not thick.

Pulmonary Tuberculosis.—Those with experience in the employment of iodized oil are of the opinion that it must be cautiously used in a tuberculous patient, and not at all in the presence of fever. Cavities, distorted bronchi, bronchiectatic cavities may be beautifully demonstrated by this procedure (*Fig. 6*). However, the anxiety and unavoidable exertion attendant on bronchography may cause increase of fever, and this has been, we believe wrongly, ascribed to the presence of the oil in the lung. We have noted a longer retention of the iodized oil in the tuberculous lung than is observed in other conditions, but we are of the opinion that the explanation is to be found in the lesser activity of the diseased lungs of such patients. However, bronchography should be resorted to only in the unusual case of tuberculosis.

Pneumothorax.—In the collapsed lung, iodized oil will reveal the condition of the tubes (*Fig. 3*). If the collapse is but partial, adhesion to the parietes otherwise not visualized may be demonstrated.

Fistulous Tract.—The exact size, location, nature and connections of a fistulous tract into the chest can be shown with exactness by iodized oil (*Fig. 7*).

As a Therapeutic Adjunct. — Bronchography supplies information not possibly to be obtained by any other means in regard to the completeness of collapsing procedures. In several cases of the type described by Singer and Graham,[8] we were able to determine, after the use of lipiodol, whether pneumothorax therapy alone was likely to be sufficient, or whether more radical surgical measures might be necessary.

SUMMARY OF INSTRUCTIONS FOR BRONCHOGRAPHY

(1) The patient is placed in the semi-lateral position with the diseased side dependent.

(2) The tongue is pulled out as far as possible, and the patient instructed to open his mouth as widely as possible.

(3) The lipiodol is warmed sufficiently to make it flow freely from the syringe.

(4) A straight cannula connected with the syringe is placed on the side of the uvula above the base of the tongue.

(5) The oil is then slowly injected. The patient is meanwhile taking deep inspirations, and instructed by all means not to cough and not to swallow.

(6) Depending upon the position of the lung one wishes to have the lipiodol flow into, the

Fig. 6

D. C., taken May 29, 1926. Delicate markings of the bronchial tree are outlined by the iodized oil. One can readily see that the lung tissue has been destroyed at the base. There has been a pneumothorax attempted. The iodized oil seen in the stomach shadow is due to the regurgitation of the oil.

patient is placed in the lateral, prone or supine position with the head tilted downward if desired.

(7) It is necessary, of course, to have the complete cooperation of the patient, as no anesthetic is used in the pharynx except in an unusually difficult case.

CONCLUSIONS

(1) Iodized oil introduced into the lung has made possible the diagnosis of pulmonary conditions formerly undiscoverable.

(2) There is no serious danger in its application.

(3) Six methods are in use. We recommend first the simplest, aspiration without anesthesia. If this is unsuccessful, the more complicated procedures are resorted to.

(4) Further experimental study must be done in order to develop the full value of bronchography.

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DISCUSSION (Abstract)

Dr. J. J. Clark, Atlanta, Ga.—Dr. Moore did not speak of the therapeutic effect of this solution on his patient with bronchiectasis. I should like to ask whether the bronchiectatic patients showed improvement. Dr. E. C. Thrash, of Atlanta, has performed this injection several times and he states that his patients gain in weight after it and many of them have returned and insisted on re-injection, because their health was so improved generally. I wonder if Dr. Singer and Dr. Moore had this experience.

Dr. J. C. Dickinson, Tampa, Fla.—Drs. Singer and Moore have presented a method of carrying out this procedure that is much less complicated than other methods

Fig. 7
G. M., taken November 7, 1925. Injection of iodized oil into this fistula shows that cavity was irregular and the tract leading into the trachea is well visualized.

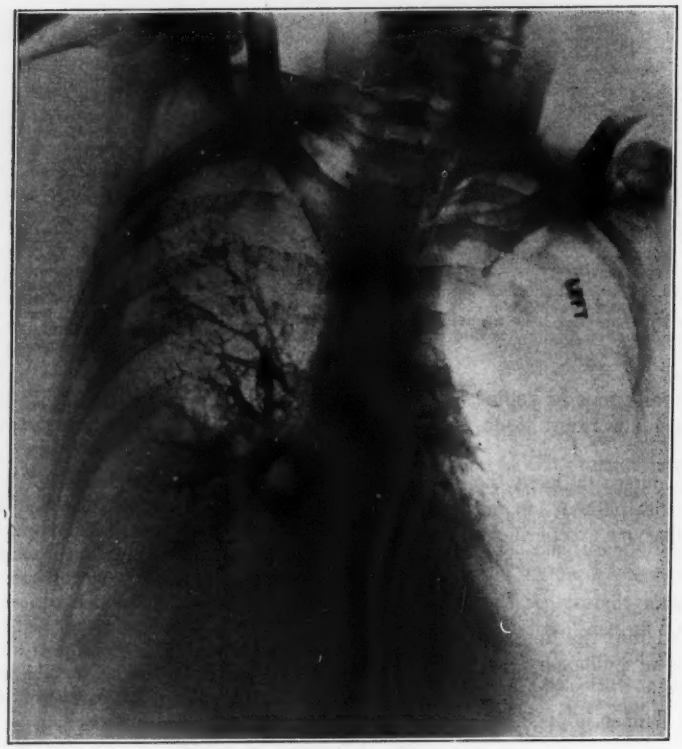

Fig. 8
D. W., taken July 16, 1926. Shows the compression of the right lower lobe, with some compression of the mid-lobe, especially laterally. The left lung shows distinctly markings somewhat compressed. The bifurcation of the trachea is well visualized. Sero-fibrinous pleurisy, right chest.

and works less hardship on the patient. Most of us have had many discouraging experiences in which the patients have been through considerable discomfort. We have tried to use the bronchoscope, injecting through a cannula into the larynx. It is a great comfort to know that there is a simpler technic of injecting the opaque medium which will give the desired information.

Dr. Moore (closing).—Dr. Dickinson's question brings out the point to which the entire paper was directed. Under the method described, bronchography is safe, simple, and with a little practice anyone may acquire proficiency in its application. This practice is harmless to the patient, and, in fact, is without discomfort. Originally we attempted bronchography with the bronchoscope, which is a great strain on the patient. We are convinced that the use of this instrument is not essential to the carrying out of bronchography.

As to the therapeutic aspects of iodized oil, I understand that early cases of bronchiectasis, or those with a slight degree of this affection, are treated by instillations at the Battle Creek Sanitarium with great benefit.

Someone asked a question about the nature of the iodized oil employed. We use lipiodol, which is a combination of poppy seed oil with iodin, the combination being such that there is 40 per cent of the latter in the substance. Poppy seed oil is an unsaturated fat, evidently with a valence for iodin. It seems that other unsaturated oils do not make quite so satisfactory a combination with iodin, either as to the quantity of iodin or as to the stability of the compound. We have tried some others. So far lipiodol is the best medium for use in those conditions in which an iodized oil is of service.

SOME UNUSUAL DERMATOSES*

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AGRANULOCYTIC ANGINA

During the past year I have seen, in consultation, two cases of agranulocytic angina. This condition was, I believe, first described by Dr. Werner Schultz in the *Deutche Medizinische Wochenscrift* for November 3, 1922. Since that time about fourteen cases have been described in the German literature, and four in the American. Of these latter, the first was by Dr. Beatrice R. Lovett in the *Journal of the American Medical Association* for November 8, 1924; the second by Dr. James H. Skiles in the same publication of January 31, 1925; the third by Drs. Joseph Moore and Henry Wider, also in the *Journal of the American Medical Association* for August 15, 1925; and the fourth, by Dr. R. J. Hunter, was in *Laryngoscope* for May, 1926.

Fig. 1
Agranulocytic angina. Illustration shows deep necrotic ulceration surrounded by bright red areola opposite the second and third molars. A similar ulceration appears on the lip.

To recall to you briefly, the chief symptoms are a prodromal period of a few days of slight malaise and general aching, followed by painful ulcerations in the mouth and rectum, chills, high fever, rapid pulse, often jaundice, and a low total white blood cell count, with a marked decrease, or total absence of the granular cells. All of the cases reported have been middle-aged women, although one of the cases I saw was a man aged forty-five. Each case died, the duration of the disease varying from eight to twenty-four days. Smears from the lesions showed the organisms of Vincent's angina in several of the cases. The blood culture of one of the cases was reported a pure streptococcus viridans. In three instances, two reported in the German literature and one by Dr. Beatrice Lovett, of Chicago, the post-mortem blood culture showed bacillus pyocyaneus. In a case autopsied by Dr. Piette, and reported in the *Journal of the American Medical Associa-*

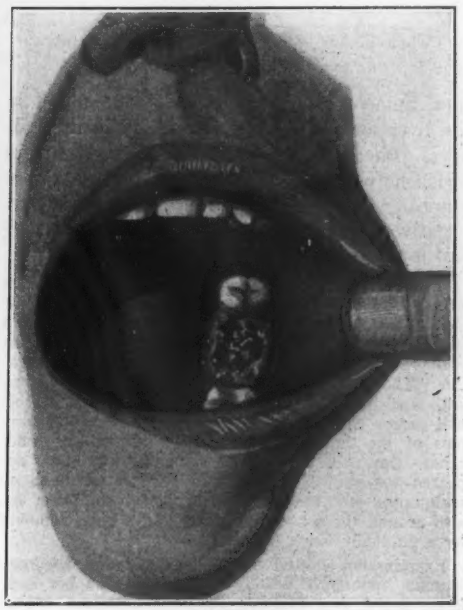

Fig. 2
Agranulocytic angina. Necrotic ulceration with marked surrounding induration at site of extraction of tooth.

*Read in Section on Dermatology and Syphilology, Southern Medical Association, Twentieth Annual Meeting, Atlanta, Georgia, November 15-18, 1926.

**Assistant Professor, Department of Dermatology, College of Physicians and Surgeons, Columbia University.

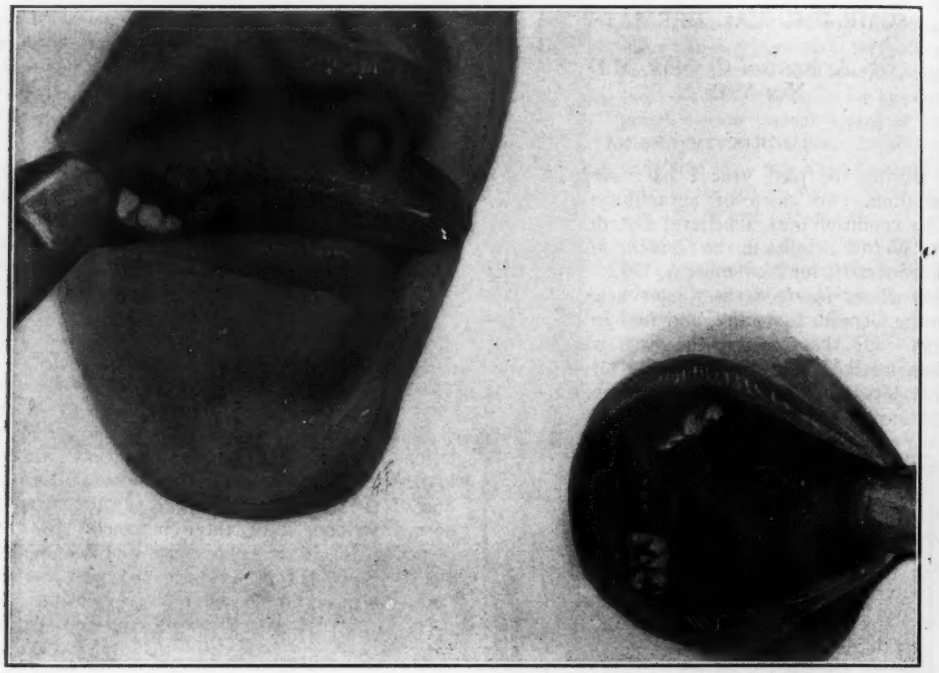

Figure 3
Lichen planus of tongue and mucous membrane of the cheek, with ulceration of tongue and annular lesions.

tion, numerous bacterial emboli were found in the liver and spleen, and especially in the kidneys. Bacilli were present in the blood stream which he was unable to grow in culture. Other autopsies performed have been for the most part negative, except for the absence of leukocytes and mylocytes in the bone marrow.

In November, 1925, I was called to see a white woman, aged 30, suffering from supposed syphilitic ulcerations in the mouth and anus. She had had a streptococcic peritonsillar abscess followed by empyema two years previously. Otherwise her history was negative. The present illness had started two weeks before, with a slight cold and sore throat contracted at a football game. She felt tired, weak, had aching and soreness of the muscles, and suffered with general headaches. One week later extremely painful ulcerations appeared opposite the second and third molar teeth on each upper jaw, and on the left side of the lower lip, also around the anus. She developed a chill, followed by a gradually rising temperature.

Examination showed a well nourished and developed woman, apparently acutely ill, lying flat on her back, knees flexed, face flushed, somewhat irrational, excited and groaning with pain. The temperature was 105.4°, pulse 145, and respiration 38. The gums surrounding each second and third molar tooth were deeply ulcerated over an area of about 2.5 by 1.5 cm. in diameter, with a central necrotic slough exposing the bone. Surrounding the ulcers was a bright red areola. (*Fig. 1.*) There was a similar ulceration about 1.5 by 1 cm. in diameter on the left side of the lower lip, and lesions of the same nature were present around the anus. Those in the anal region were so painful that the physician had been forced to give the patient a general anesthetic in order to examine her. Examination of the heart, liver and spleen, pupillary, and deep reflexes was negative.

The clinical symptoms were such as to lead us to believe that we were dealing with an acute infection which was suggestive of a Vincent's angina, with a secondary infection and probably a septicemia. Smears and cultures from the ulcers showed numerous spirilla, bacilli and streptococci. The blood culture was reported as streptococcus viridans. The total white blood cell count was 400, with an absence of granular cells; the hemoglobin and red blood cells were normal, as were the Wassermann and urine reports. The patient grew steadily worse, and died one week later. The autopsy was negative.

The second case occurred in a white man, and the ulceration of the gum started with the extraction of a tooth. He lived three weeks. In this instance, the ulceration differed from the first case in that it presented considerable induration around the slough, a condition which led two physicians to suspect a leukemic ulcer. (*Fig. 2.*) The blood culture was negative. Otherwise the clinical picture and laboratory findings were practically identical with those already described.

Fig. 4
Lichen planus, showing annular and papular lesions.

It is interesting to note in the reports of agranulocytic angina that a diagnosis of Vincent's angina was made in most cases, and that they were given arsphenamin intravenously and locally. In the first case we used, in addition, sodium bi-borate. The large slough was trimmed and the wounds packed with iodoform gauze. The second patient was given blood transfusions, but no form of treatment had effect on either patient.

In discussing this disease, Major Reisoner, of the U. S. A. M. C., who has had quite extensive experience with Vincent's organism, told me that he was decidedly of the opinion that the Vincent's spirilla was the specific cause of the trouble, and that the failure to culture the germ from the blood stream was due to the difficulty with which the spirilla can be grown in any medium.

LICHEN PLANUS WITH ULCERATION OF THE TONGUE

Mr. A. consulted me for diagnosis of an ulceration on the right border of the tongue, opposite the second molar tooth. The lesion had first attracted his attention four months previously, and he had noticed no subsequent change in the character of the sore. Except for slight pain at intervals, there were no symptoms. The ulceration was about 1.5 cm. in diameter, slightly raised, red, granular, with a central erosion. Surrounding the ulceration, and extending along the border of the tongue and mucous membrane of the floor of the mouth, and the sides of the cheeks, there was a lacy arrangement of grayish-white colored thread-like lines. (*Fig. 3.*) The linear elevations were ring or oval-shaped, the centers being normal in color, or only slightly erythematous. Minute, stellate, grayish-yellow colored papules, mustard seed in size, were studded here and there over the affected area, the papules which are always very suggestive of lichen planus. The gums were red, swollen, spongy, and in places eroded.

In the course of a complete physical examination there were noticed on the glans and shaft of the penis, and on the scrotum, numerous annular and papular, bluish-red colored and scaly lesions. (*Fig. 4.*) Some of the papules had a central depression with white, linear striations, presenting the typical appearance of lichen planus.

You also have probably observed how few physicians suspect a lichen planus from the appearance of the mucous membranes alone, especially when there is an associated ulceration. In the case cited, eight physicians, four of whom were dermatologists and two dentists, made vary-

Fig. 5
Primary actinomycotic abscess of tongue with a superficial transverse fissure.

Fig. 6
Section from tongue in Figure 5. Low power, showing actinomycotic granules imbedded in granulation tissue.

ing diagnoses, such as carcinoma, syphilis, tuberculosis and ulceration from pyorrhea.

Lichen planus of the mucous membrane is just as diagnostic in appearance as are the skin lesions, and while cases often present eruptions on both the cutaneous surface and mucous membrane at the same time, the disease is not infrequently found in either one or the other location alone.

PRIMARY ACTINOMYCOSIS OF THE TONGUE

In October, 1926, I saw a white man, aged 49, who complained of a swelling of about two months' duration on the left border of the tongue. His attention was first directed to the enlargement by a small painful erosion. He had noticed no change in its size, although for three weeks his tongue had felt thick and heavy, and food had collected between the tongue and cheek. There was slight pain over the enlargement, and he could put his finger over the tender painful area. He had had frequent sore throats during the previous year, and had been advised by several physicians to have his tonsils removed.

On examining him, we found a swelling on the left border of the tongue and floor of the mouth opposite the two last molar teeth, measuring about 4 by 3 cm. in diameter. (*Fig. 5.*) The surface was smooth, of the same color as the surrounding mucous membrane except for a whitish appearance in the center. The swelling was sharply defined, rounded in shape, with gradually sloping borders. The sides were firm, while the center was elastic, and doughy to the touch. We anesthetized the area with novocain, and used a 1 cm. skin punch to bore out a piece of tissue from the center of the lesion. When we penetrated the cavity a grayish-yellow colored, granular, stringy, thread-like material containing pus shot out. Smears and cultures of this material were submitted to Professor Hopkins, of the College of Physicians and Surgeons, who reported actinomycosis, and the finding of a typical mass of the mycelium of actinomycosis in the biopsy section. (*Figs. 6 and 7.*) The walls were lightly curetted, and the cavity swabbed with tincture of iodin. The wound promptly healed with an apparent cure of the condition.

The patient, before consulting us, had been seen by several physicians both in this country and in Europe, where he was traveling when his tongue first became painful. None of them was able to arrive at a diagnosis.

While actinomycosis is relatively a common affection in humans as well as in animals, primary actinomycosis of the tongue is a rare finding. As you recall, the tongue is more usually infected by metastasis or direct extension. Out of one hundred and twenty-seven cases of actinomycosis appearing at the Mayo Clinic between 1910 and 1921, and described by Drs. New and Figi in the *Journal of Medical Sciences* for April, 1922, only three presented the initial

Fig. 7
High power of section 6. White arrow in center points to clubs at border of granule.

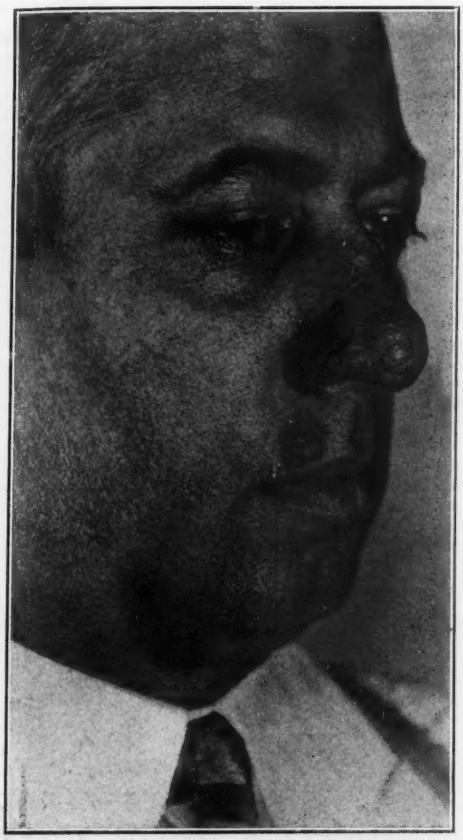

Fig. 8
Syphilis of nose resembling acne rosacea.

lesion on the tongue. Drs. New and Figi reviewed the literature up to this date and found that out of almost two thousand cases, thirty-five occurred primarily in the tongue, making with the three of their own series, a total of thirty-eight. Of these, twenty-seven were male, ten females and in one case the sex was not stated. All cases occurred in adult life, and approximately one-half were connected with rural life and one-half with urban life.

SYPHILIS OF THE NOSE RESEMBLING ACNE ROSACEA

About three months ago a white man, aged 37, consulted me for an eruption on his nose and on the right side of the upper lip, which had been treated as acne rosacea. In spite of his having received twelve x-ray exposures in addition to local applications, colon irrigations, and having had his diet restricted, the lesions had continued to spread.

Examination showed an enlarged, bluish-red colored nose studded with numerous pea-sized, firm, scaly papules and pustules with a tendency to grouping, especially on the upper lip. (*Fig. 8.*) The inflammation and hyperplasia extended onto the mucous membrane of the right nares. On the outer and lower third of the left leg was a large, subcutaneous, tender swelling about 5 inches by 2.5 in diameter, apparently attached to the bone. The patient had not mentioned this condition, but on being questioned, stated that it had been present for ten months, and at the onset had been so painful that he was practically incapacitated. An x-ray of the leg showed a localized periosteal lesion, with no evidence of bone destruction. An aortitis of moderate degree existed.

He admitted having had an ulceration on the penis fourteen years before, for which he had received local treatment only.

His Wassermann reaction at the time he came to us for diagnosis was four plus with all antigens. The lesions entirely disappeared after eighteen days of antisyphilitic treatment.

We are impressed by the similarity that often exists between certain types of syphilis and acne rosacea. During the past three months I have seen three cases of syphilis of the nose resembling the one described, which have been treated for acne rosacea, the correct diagnosis not being

Fig. 9
Melano carcinoma showing numerous nodules.

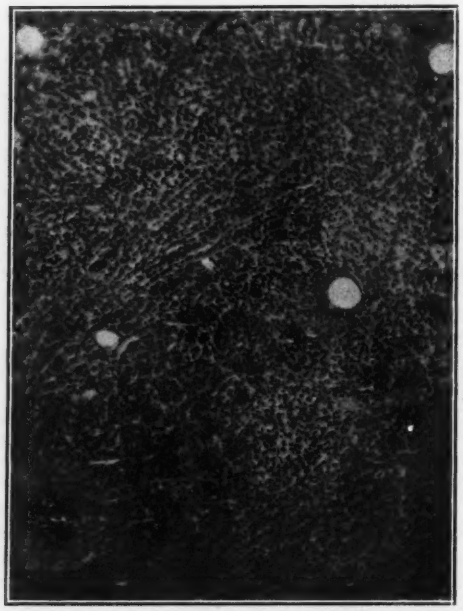

Fig. 10

Section 1936. Low power. Metastatic nodule from the skin over the abdomen shows a large tumor mass in areas lobulated, while in other areas may be seen long strands of tumor cells and mytotic figures.

suspected until the patients had failed to respond to the usual treatment for rosacea. It sometimes requires most painstaking physical and neurological examinations, and the result of the Wassermann test to establish definitely the diagnosis. The possibility of a syphilitic infection should always suggest itself when there is a hyperplasia of the nose with pustules and firm papules, especially where they are grouped, and when the condition involves the mucous membrane.

METASTATIC MELANO-CARCINOMA ARISING FROM A MOLE

A white man 27 years old, whose only complaint was multiple painless nodules on the skin, was referred to me for diagnosis. Six weeks before, he had noticed an almond-sized lump on the left shoulder which was followed by the appearance of numerous others in rapid succession over the trunk and extremities. He had had gonorrhea and a chancroid three years previously.

He was a well nourished and developed man, in apparently good health. Over the body and extremities, most marked on the trunk, were numerous nodules varying in size from 0.75 to 2.5 cm. in diameter. (*Fig. 9.*) Some were subcutaneous, the skin being freely movable over them, while others were attached to the skin, and some were intradermal growths of a slightly bluish tinge. They varied in consistency from a moderate firmness to a stony hardness, and were non-tender to pressure. The subcutaneous lesions often occurred at regular intervals and in line, giving the impression of following the lymphatics. The superficial glands, liver and spleen were not enlarged. The heart, lungs, neurological and eye examinations were negative. The blood count, Wassermann reaction and urine analysis were negative. A nodule removed from the skin over the abdomen showed on microscopic examination melano-carcinoma. (*Fig. 10.*) About three weeks after the first physical examination I was able to see on the scalp, owing to a very close hair cut, a dime-sized ulcerated lesion just above the left ear, having the appearance of a mole. This, the patient said, was due to his physician's attempted removal of a mole by cauterization six months before. Previous to my discovery of the mole he had steadfastly denied ever having had a growth of any kind removed. A biopsy report of the lesion showed a malignant pigmented mole. (*Figs. 11 and 12.*)

The patient failed very rapidly during my observation of him. The tumors increased in size and number, the liver and spleen became slightly enlarged, he lost weight and strength, and became pale. Death occurred about two months after my observation of him was terminated by his leaving for his home in Den-

Fig. 11

Malignant mole. Section 1926. Low power. Shows the pathological process to extend across the entire length of the section and down to deep cutis, except on the right margin, where it extends down to the fat. The tumor is sharply defined, coarsely lobulated, and in the upper right side is a large area of necrosis and hemorrhage which form the center of the tumor and base of the ulcer on the surface. The epidermis is flattened out over the surface, and beyond the edge of the tumor is acanthotic, with long strands of the rete pegs projecting down into deep centers.

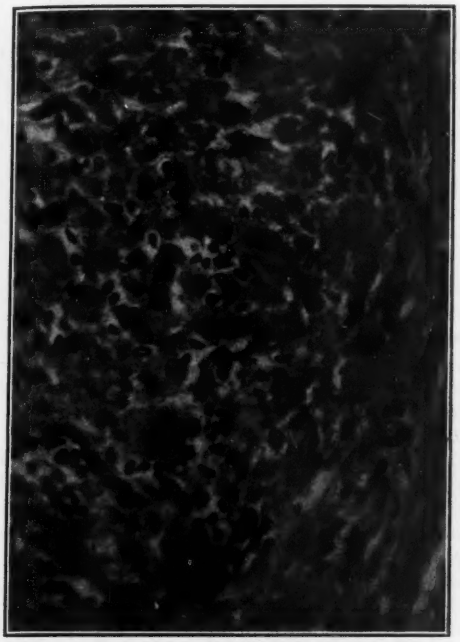

Fig. 12
Malignant mole. Section 1926. High power. Shows lower border of same tumor with a fibrous capsule. Above are large epithelial cells, nevus cells, multinuclear cells, and two mytotic figures. Diffuse lymphocytic cellular infiltration is present.

mark. Ten months had elapsed between the cauterization of the mole and the fatal outcome. Melanin was present in the urine only during the last ten days of my observation.

The time of occurrence and amount of melanin in the urine depend upon the amount of pigment in the tumor cells, and in cases in which there is slight pigmentation little or no melanin is excreted by the kidneys. As a rule, even in cases showing deeply pigmented carcinomatous cells, melanin does not appear in the urine until the terminal stages of the disease. By some, its appearance is considered pathognomonic of melanocarcinoma, but I have seen one case of jaundice of the catarrhal type, in which there was a considerable amount of melanin in the urine over a period of a few weeks. Others have reported similar observations in other diseases.

We frequently see cases of metastatic melanocarcinoma arising from an attempted removal of a mole by excision or cauterization with acid. As a rule, such moles are harmless if not subjected to irritation, and it is far better to leave them undisturbed, or else do a complete removal by means of electrolysis, desiccating needle, or the actual cautery. By any of these methods, the removal of the moles is a simple and safe procedure.

20 East Fifty-Third Street.

COMPARISON OF THE KOLMER MODIFIED WASSERMANN TEST WITH THE KAHN TEST IN TWENTY-FIVE THOUSAND SERA*

By WM. LITTERER, A.M., PH.C., M.D.,**
Nashville, Tenn.

For the past several years we have been running routinely, in the State Laboratory of Public Health, the Kahn precipitation test and the Kolmer modified Wassermann.

In our study of the comparison of the Kahn precipitation test with the Kolmer modified Wassermann in twenty-five thousand serums, we have been quite fortunate in the majority of instances in obtaining fairly accurate clinical data and to some degree being in touch with the patients.

A large number of our bloods for this special study was obtained from the various public institutions of the state, for example: the various insane asylums, the state penitentiary, institutions for feeble-minded and reformatory schools, etc.; also from the Nashville General Hospital, the Vanderbilt Hospital and Vanderbilt Venereal Disease Clinic. Likewise quite a number of serums were received from physicians from various parts of the State. Fairly complete histories were obtained in this way. Where no history could be elicited, we did not include the case in this report.

TECHNIC OF TESTS

Kahn Technic.—The technic employed in the Kahn precipitation test was that recommended by the author in his book on "Serum Diagnosis of Syphilis by Precipitation."[1] Not only was the standard method used but also in most instances the special antigen for quantitative or presumptive procedure was employed.

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*Read in Section on Public Health, Southern Medical Association, Twentieth Annual Meeting, Atlanta, Georgia, November 15-18, 1926.

**Director of Laboratories, Tennessee State Department of Public Health.

1. Kahn, R. L.: Serum Diagnosis of Syphilis by Precipitation. Williams & Wilkins Co., Baltimore.

Kolmer Technic.—The technic employed was that described in the third edition of Kolmer's "Infection, Immunity and Biologic Therapy."[2] The only difference was that the natural anti-sheep hemolysin was absorbed from each specimen. This test is a quantitative procedure in which a cholesterinized antigen is used with overnight ice box fixation followed by from five to fifteen minutes in a water-bath at 37° C.

Reading and Recording Results.—In reading reactions we used the terms, (1) marked fixation or precipitation; (2) partial fixation or precipitation; (3) slight fixation or precipitation; and (4) no fixation or precipitation. No account was recorded in slight disagreements.

In recording the comparison of Kolmer complement-fixation tests with the Kahn precipitation tests, the results were read and recorded independently by two workers. When an extra worker was not available, the results were reread by the worker about ten minutes after the first reading. We employ the Kahn presumptive procedure test routinely. It is of considerable value in weakly positive or doubtful reactions. We regard it as an additional check on the standard method.

CHART 1

COMPARISON OF TWENTY-FIVE THOUSAND SERUMS WITH KOLMER MODIFIED WASSERMANN AND KAHN PRECIPITATION TEST

Number of Serums	Kolmer	Kahn	Percentage
15,900	Negative	Positive	63.6 Negative agreement
7,775	Positive	Positive	31.1 Positive agreement
23,675			94.7 Total agreement
800	Negative	Positive	3.2 Pos. Kahn and Neg. Kolmer
525	Positive	Negative	2.1 Pos. Kolmer and Neg. Kahn
25,000	Total number of serums examined		100.0

In *Chart 1* are the results of parallel tests with the Kolmer modified Wassermann test and the Kahn precipitation test in twenty-five thousand serums. Relative complete agreement was obtained in twenty-three thousand six hundred and seventy-five serums giving 94.7 per cent total agreement. The Kahn was positive and the Kolmer negative in eight hundred serums, giving 3.2 per cent of disagreement. The Kolmer was positive and the Kahn negative in five hundred and twenty-five serums, giving 2.1 per cent disagreement.

2. Kolmer, J. A.: Infection, Immunity and Biologic Therapy. 3rd Ed. W. B. Saunders Co., 1923.

CHART 2

ANALYSES OF EIGHT HUNDRED CASES WITH KAHN POSITIVE AND KOLMER NEGATIVE

Number Cases	
560	gave a definite clinical history (414 were treatment cases)
32	gave a suggestive clinical history
15	gave no clinical history
193	no data available
800	total

Of the five hundred and sixty cases (*Chart 3*) showing a positive Kahn and a negative Kolmer, giving definite clinical histories, there were four hundred and fourteen treatment cases that previously had shown a positive complement-fixation reaction. There were eighteen early primary syphilis (chancre stage) in which the *Treponema pallidum* were demonstrated by dark field. There were five cases of cerebrospinal syphilis and three cases of tabes dorsalis, all showing positive spinal fluid by both the Kolmer and Kahn tests, but their bloods showed a positive Kahn and a negative Kolmer. The remaining one hundred and twenty cases gave a definite clinical history of syphilis which subsequently responded to anti-luetic treatment.

CHART 3

ANALYSES OF FIVE HUNDRED AND SIXTY CASES SHOWING POSITIVE KAHN AND NEGATIVE KOLMER

414	were treatment cases previously showing positive Kolmer tests
18	were early primary (chancre stage) spirochetes by dark field
5	were cerebrospinal with positive spinal fluid to Kahn and Kolmer tests
3	were tabes dorsalis with positive spinal fluid to Kahn and Kolmer tests
120	were clinically typical lues which responded to anti-luetic treatment
560	total

Of thirty-two cases (*Chart 2*) that gave a suggestive clinical history of syphilis in which a positive Kahn and a negative Kolmer were found, there were twenty-one that yielded to anti-syphilitic treatment which eventually resulted in a negative Kahn test after treatment was completed. The remaining eleven cases could not be followed.

Of the fifteen cases giving a positive Kahn test with no clinical history, there were eleven cases that showed a Kahn one-plus to two-plus (partial precipitation). Further observations on these cases were not possible. There were four remaining cases out of the fifteen that gave a Kahn three-plus and four-plus (marked precipitation) with no clinical histories or symptoms

of syphilis. Two out of this number were later proved to be syphilitic by demonstration of syphilitic lesions and the *Spirocheta pallida* by autopsy.

Case 1.—F. W. T., a white man, age forty, who entered the Nashville General Hospital, had typhoid fever. He denied having had syphilis, and had no clinical manifestations. The physical signs were negative. Three weeks later he died of typhoid fever with hemorrhage of the intestine. Autopsy revealed a typical picture of ulceration of Peyer's patches and hemorrhage in the bowel, enlargement of the mesenteric lymph nodes and spleen, and typhoid bacilli were recovered from the blood and feces. The other organs were normal, with the exception of the aorta, which presented a picture of a syphilitic aortitis. The *Spirocheta pallida* was demonstrated in the endothelial tissue of the aorta by the Levaditi method of staining.

Case 2.—C. W. K., a white man, age forty-two, was admitted to the Nashville General Hospital with a lobar pneumonia. He denied having had syphilis, and there were no clinical manifestations. The physical signs were negative. Eight days after admittance he died of lobar pneumonia. Autopsy revealed typical lobar pneumonia of the left lung. The heart showed myocarditis, which, upon examination according to the method of Warthin, revealed numerous *Spirocheta pallida* throughout many areas of the myocardium.

These two cases illustrate that one cannot always ascertain from the past or present history whether or not a case is syphilitic, nor can it be determined from negative physical findings.

In one hundred and ninety-three cases no data was available.

CHART 4

FIVE HUNDRED AND TWENTY-FIVE CASES WITH KOLMER POSITIVE AND KAHN NEGATIVE

Number of Cases	
327	gave a definite clinical history
21	gave a suggestive clinical history
26	gave no clinical history
151	no data available
525	total

Of the three hundred and twenty-seven cases (*Chart 5*) showing a positive Kolmer and a negative Kahn, giving a definite clinical history, there were sixty treatment cases which previously had shown a positive Kahn test (standard procedure) before treatment. However, forty out of the sixty of these treatment cases showed a positive Kahn with the presumptive procedure. There were five of early primary syphilis (chancre stage) in which the *Treponema pallidum* was demonstrated by dark field.

There were two cases of cerebrospinal syphilis and one case of tabes dorsalis showing positive spinal fluids by both Kahn and Kolmer technic, but their bloods showed a negative Kahn and a positive Kolmer. The remaining two hundred and fifty-nine cases gave a definite clinical history of lues which subsequently responded to anti-syphilitic treatment.

CHART 5

ANALYSES OF THREE HUNDRED AND TWENTY-SEVEN CASES SHOWING POSITIVE KOLMER AND NEGATIVE KAHN

60	were treatment cases previously showing positive Kahn test (standard method)
5	were early primary (chancre stage) with spirochetes by dark field
2	were cerebrospinal with positive spinal fluid to Kolmer and Kahn tests
1	was tabes dorsalis with positive spinal fluid to Kolmer and Kahn tests
259	clinically typical lues which responded to antiluetic treatment
327	total

Of the twenty-one cases (*Chart 4*) that gave a suggestive clinical history of syphilis in which a positive Kolmer and a negative Kahn were recorded, there were eleven that yielded to antiluetic treatment which eventually resulted in a negative Kolmer test after treatment was completed. The remaining ten cases could not be followed.

Of the twenty-six cases (*Chart 4*) giving a positive Kolmer test and a negative Kahn with no clinical history of syphilis, there were thirteen that showed a Kolmer slight fixation and ten that showed a Kolmer partial fixation. Further observations on these cases were not possible. There were three remaining cases out of the twenty-six that gave a Kolmer (marked fixation) with no clinical histories or symptoms of syphilis. One case out of this number later proved to be syphilitic as is shown from the following record.

Case 1.—C. H. B., a white man of 38 was admitted to the Nashville General Hospital for gangrenous appendicitis. Operation was performed and the patient made an uneventful recovery. He denied syphilis; there were no clinical manifestations, and the physical signs were negative. His white blood count was eight thousand. The patient refused anti-luetic treatment and left the hospital apparently well in four weeks' time. In one year he returned with all the symptoms of a typical case of cerebrospinal syphilis. His spinal fluid showed strongly positive Kolmer and Kahn reactions.

No available data could be obtained from one hundred and fifty-one cases (*Chart 4*).

FALSE POSITIVES

Among the twenty-five thousand serums there were fifteen cases that showed a positive Kahn and negative Kolmer, and twenty-six cases that gave a positive Kolmer and negative Kahn re-

action, in which no history could be elicited of recent or latent syphilis. The physical findings were negative to lues. Of the fifteen cases that gave a positive Kahn, there were eleven in which the Kahn test showed a partial precipitation (one-plus to two-plus) by the standard method. Further observations on these cases were not possible at the time. Later on we hope to make further observations on the majority of them. There were four cases that gave a marked precipitation with the Kahn method, in whom no clinical history could be obtained. Two of these cases, as cited elsewhere in the paper, proved subsequently to be syphilitic on autopsy by the demonstration of spirochetes within the tissues of the affected organs.

Of the twenty-six cases that gave a positive Kolmer and negative Kahn in which no syphilitic history could be ascertained, thirteen showed a Kolmer slight fixation and ten showed a partial fixation. Further observations on these cases were not possible at the time. However, later on we hope to make a further report on the majority of them.

There were three cases that gave a marked fixation with the Kolmer technic and a negative with the Kahn, in which no clinical history of lues could be elicited. One of these cases, as cited elsewhere in the paper, proved absolutely to be syphilitic.

From our observations of both the Kahn and Kolmer tests with regard to false positive reactions, the conclusions are warranted that when a positive reaction is obtained (especially with a re-check to allow for error) in the face of discordant or absent clinical data, the burden of proof rests upon the clinician and a thorough and exhaustive search for clinical evidence of syphilis is indicated.

CONTAMINATED AND ANTI-COMPLEMENTARY SERUMS

The majority of our bloods were received through the mails sent in to the Central Laboratory of the Tennessee State Department of Public Health, sometimes taking two or three days to reach the laboratory. Many of these bloods were received in an apparently contaminated condition or had undergone partial hemolysis. Not infrequently serums were anti-complementary to the complement fixation test, while the Kahn test in most instances was influenced neither by contamination nor by anti-complementary properties as is shown by the accompanying figures. Out of twenty-five thousand serums there were eight hundred and twenty-five that were anti-complementary to the complement-fixation test, or 3.3 per cent. On the other hand, out of twenty-five thousand serums there were one hundred and thirty-one that were not available to the Kahn test, or 0.6 per cent.

CHART 6

UNSATISFACTORY SERUMS IN TWENTY-FIVE THOUSAND BLOOD SPECIMENS

Total Number of Specimens	Unsatisfactory		Percentage
25,000	825	Kolmer	3.3
	131	Kahn	0.6
	694		2.7

When a serum is unsatisfactory to Kahn, it is likewise unfit for the Kolmer test.

CONCLUSIONS

(1) In twenty-five thousand serums there was an agreement of 94.7 per cent between the Kolmer modified Wassermann test and the Kahn test.

(2) The chief divergence between the two tests lies in the treatment cases. Undoubtedly the Kahn test is more sensitive in these cases. It should, therefore, be quite valuable in checking up treatment cases.

(3) A procedure of considerable value in the Kahn test (which we use routinely) is the employment of an additional check (presumptive procedure), especially in serums presenting weakly positive or doubtful readings.

(4) The Kahn test is practically indispensable in state laboratories where many blood specimens reach the laboratory through the mails in an apparently contaminated or partially hemolysed condition. These show not infrequently anti-complementary reactions in the Wassermann test but give specific reactions in the Kahn test.

(5) The simplicity, sensitivity, specificity and rapidity of execution of the Kahn test demand its employment in every serological laboratory. However, we are of the opinion that the Wassermann test, or some of its various modifications, and the Kahn test should be conjointly performed, as they shed a useful complementary light upon each other. Each test will pick up a certain per cent of positives that one or the other will not reveal.

DISCUSSION (Abstract)

Dr. L. C. Havens, Montgomery, Ala.—There have been, of course, a large number of comparisons of the Kahn and Wassermann tests. Dr. Litterer is to be

congratulated on the exhaustive work he has done. I know of no other which covers in such detail such a large number of specimens. His conclusions are what any conservative public health worker will reach in regard to the Kahn test.

A test for syphilis is too important to be accepted without a great deal of careful analysis and comparison with the previous tests which have been used and found to be of definite value. The Wassermann test is probably the most valuable single laboratory test we have; but that is no reason for our closing our eyes to a new test which may be proposed.

As Dr. Litterer has pointed out (and it has been found consistently true in comparisons of the two tests), there is a certain percentage of serums which fail to agree: some will be positive with the Wassermann and negative with the Kahn, and others the reverse. What these results mean still remains to be seen.

Our experience in Alabama with the Kahn test has been very similar to that of Dr. Litterer. We are now using in one of our laboratories the Kahn in parallel routinely with the Wassermann test. What we find with anti-complementary serums is that the great majority of them give a positive result. Whether this is specific or not, we do not know, but there is evidence accumulating all the time that the anti-complementary properties of the serum that give the non-specific positive Wassermann test are, in the majority of instances at least, of syphilitic origin. The Kahn precipitation test cannot yet, of course, replace the Wassermann test, but it is undoubtedly worth while as a parallel test with some good modification with the Wassermann.

MALNUTRITION IN OLDER CHILDREN*

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The title of this clinic should in reality be "Undernutrition." The term malnutrition properly applied refers to overweight children as well as underweight. This is distinctly undernutrition. The term undernutrition is subject to a number of interpretations. Unfortunately at present we have no definite criterion of what is normal in a child as to height or weight, or height in relation to age, or weight in relation to age. Weight to age is not considered today, but weight in relation to height. There are a number of factors which enter into all of our calculations.

To be very brief, we hear of familial tendencies, a tall, slender family and a short stout family. Undoubtedly familial tendencies exist, but in all probability the life of the child during early infancy determines the relation of the weight to height, more than the hereditary characteristics in most instances. Then we must, having no criterion of the normal child, base our ideas on the average. We must take the weight and height of a large number of school children throughout the land and average them, making that the basal line on either side of which is computed underweight or overweight. Naturally, in a mixed population such as ours the relation of weight for height and height for weight, is influenced by racial tendencies. One more very important thing is: in the large cities with mixed racial characteristics we have a distinctly different form of height for age than in certain select private schools. The question naturally arises whether we shall consider the average height of all children in public schools as the average, or the select classes in the private schools. For general purposes we accept the former group, the children who belong to the vast population, for those children belong to the public school workers and those we have to deal with most.

We realize, then, that for every inch of height there is a definite amount of weight which we consider normal. What constitutes undernutrition? Various authorities feel differently about this subject. Some consider 10 per cent underweight as a recognizable underweight and believe attention should be paid it very promptly. Some consider 7 per cent, some go to 12 per cent. Be that as it may, one thing must be kept in mind: that the young growing child who is not gaining in weight is actually losing. We adults can keep the same weight year after year and not lose, but when a growing child does not gain in weight it is losing. There must be a commensurate amount of weight gained for every inch of height acquired. Some authorities go so far as to say that the whole subject, barring certain pathologic underlying factors, should be ignored. I cannot go so far. I feel that the child who is definitely underweight is a handicapped child. If he is 10 or 12 per cent underweight, he is a sick child. That child rarely keeps up with his school work and his exercises, and if he does so it is a great strain on his nervous system. These children have all kinds of nervous evidences: they have hot and cold perspiration, mottling of the skin, clammy skin. They either become the laggards in the school, or go ahead with feverish energy and break down. A large number of school children start their undernutrition during the first year of life, from which it becomes perpetuated.

Where we have the overweight child in many instances we will find that the child has formed

*Clinic, General Clinic Session, Southern Medical Association, Twentieth Annual Meeting, Atlanta, Georgia, November 15-18, 1926.

a habit of overeating from the example set by other members of the family. Overeating is a familial state. As to whether there is a slender child on a pathological basis, I am not prepared to say and think nobody can tell us this at present.

Recently, on what has been done with the human growing organism, there has been found in the higher and lower vertebrates that when malnutrition was started early in life the symptoms persisted for several generations. The cells did not take in their proper amount of nourishment.

There are many causes for undernutrition: first, lack of food; second, improper food; third, faulty food habits, and fourth, bodily defects. I believe faulty food habits have as much to do with undernutrition as anything else. A prominent physiologist talking from the same platform with me recently said it made no difference whether the child ate regularly or not. From the biologic standpoint that may be true, but from the practical standpoint it is not. Faulty food habits have as important a bearing on undernutrition as anything else. Undernutrition is not limited to the poor. A large percentage of the children of the well-to-do are undernourished.

I have not touched on one very important phase, and that is infection: infection of the tonsils, of the teeth, of the paranasal sinuses, which are badly neglected in so many instances. Careful examination is important. Vulvovaginitis may also be very important in undernutrition. I touch the next subject with great hesitation, the question of intestinal parasites. Some, for example hookworm, cause great degrees of undernutrition. I am of the opinion that any intestinal parasite has a marked effect on undernutrition, although there are marked exceptions to the rule. The strongyloides causes undernutrition so like hookworm in its symptoms that it is very difficult to differentiate.

We have some little patients whom I wish to show you hastily (presenting patient.) This little girl is seven and a half years old. The family history is not important in this particular case. The social history is. There is an economic deficiency in the home which makes for improper feeding. The breakfast of this child consists of gravy, potatoes, coffee and bread. For luncheon she has one pint of milk, the redeeming article of the whole day's diet, some soup, vegetables and bread. For her dinner she has buttermilk and bread. Although there are some articles in the diet that are good, it is a very poorly balanced diet for this child. We do not get any information as to the quantity of food she receives, and that may have just as definite a bearing as anything else.

This child is forty-seven inches tall and she weighs forty pounds, so she is 20 per cent underweight. She is undersized. She has probably been undernourished all her life, and there is a question of how far undernutrition during this period goes in making for stunted growth in after life. In many instances these children catch up when they receive a sufficient amount of food, based on caloric needs, and a well-balanced diet for long periods.

We hear much of the fatigue posture. Some one asked me if I was a "posture nut." Perhaps I am. Undoubtedly when a child is not gaining, and is 10 to 20 per cent underweight, it cannot hold itself as it should. I work in the mountainous sections of Virginia and the people are poor. They have to work hard; there is no question about that, and those children find it impossible to keep up the posture they should. Practically every man and woman in my region of the Blue Ridge and Alleghany mountains has an improper posture.

This child has not the development of subcutaneous fat to hold the shoulders up. There is the definite development of a fatigue posture. The normal child's chest should protrude beyond the chin line. This child's is well within the chin line. The abdomen is protruding beyond the chest line, and there is a definite curvature of the spine forward. There is too much flexion in the lumbar region anteriorly (lordosis). As she grows older and has burdens to bear, she cannot overcome these defects unless proper food is given and nutrition is improved during this period. What the real importance of this is I do not know. It is a moot subject.

This child has a nasal discharge. She is not syphilitic. The teeth are in unusually good condition, and I am told that this is due to something which I must commend in Atlanta. When children here come to school with clean mouths and clean teeth, they are given a holiday every so often. I say, let us have more holidays based on that. There is nothing abnormal in her neck except slight tonsillar enlargement. If the tonsils are markedly enlarged, and there is glandular involvement in the neck, the tonsils should come out, and until that is done the child will not gain in weight.

The physical examination of the chest is negative. One scarification tuberculin test was negative. I would not trust to that. I would not trust a Pirquet unless it was positive.

The urinalysis was negative. Blood examination showed 3,840,000 red cells, 10,000 white, hemoglobin 78 per cent. There were 10 per cent eosinophils. This may or may not mean anything. The child's brother has been shown to be infested with a tapeworm. A skiagraph of the chest shows considerable hilus fibrosis, more marked on the right side. There is a limited amount of peribronchial thickening. The apices show no increased density, and the heart and aorta are normal in size and position.

Case 2.—Here is a little girl who comes from another environment which is not good. There is a definite tuberculous infection in the family, and the child has been exposed to it. The Pirquet test, which I would not rely on, is negative, but x-ray examination shows a

doubtful chest. The chest findings alone do not justify a diagnosis of tuberculosis, but with such a history other skin tests should be made and another skiagram should be made within a year.

This little girl's habits of food are not as good as they might be, and that is another cause for her undernutrition. She is fifty-one and a half inches tall and weighs fifty-five and a half pounds, so she is almost 15 per cent underweight. Her tonsils are slightly enlarged.

Here is a child who shows even more than the other child, although there is a smaller percentage of undernutrition, the faulty posture. Her scapulae are flared more, her abdomen protrudes more, and she has the fatalistic expression of the type to which she belongs. The importance of this subject is vast, in my opinion. I know many of my friends differ somewhat from what I usually say. Regardless of what they may think about it, undernutrition is not a desirable condition. What shall we do about it? We must look for foci of infection and find them where it is possible. No child can gain very well if he has a chronic absorption of toxin. As Emerson, of Boston, says, children must be made free to gain. I do not think that tuberculosis is a frequent cause for undernutrition. Many of the children with tuberculosis are overweight, but every child who has that kind of infection is not only potentially an undernourished child, and potentially has an open case of tuberculosis in the future, but most of them are going to become tuberculous if they are not yet.

In the treatment of tuberculosis in childhood, which is the only time we find incipient tuberculosis such as is present in the public schools, the problem of overcoming undernutrition and malnutrition is the problem of overcoming tuberculosis. These children should have these infections removed as early as possible. They should be fed on a balanced diet, milk, eggs, leafy vegetables and fresh fruit. Vary that as much as you choose for taste, but it forms a safe guide for the diet. Rest is important. A child can gain on a well balanced diet when it rests, as it cannot gain when running about. An adequate amount of food, a balanced ration, and rest will do wonders.

What do we mean by rest? For a child 20 per cent underweight I would put her to bed for one, two or three weeks, if necessary, until she catches up. I am told that children underweight can be made to gain in this way, but that when they get up they soon go back to the former condition. That is true. The parents must be taught and be made our best ally. The child also must be educated. I give the child a balanced diet, based on calories, and we get remarkable results. They may gain beyond the average for childhood and drop back; but if their parents are intelligent and the children are cooperative, they can be brought back to normal.

Case 3.—We have no record of this little boy, but I want to present him to you. This is another member of a family that is not tuberculous. The child is probably suffering from the same lack that the other child was. That is where sociology and pediatrics come in along with medicine, and this is where relief work accomplishes much more than drugs.

In closing, I ask you, please, in your school work not to force a child who is undernourished to do much work. Let us try to build up in this generation a more stable citizenry in America for the next generation.

ROENTGEN PLEUROPNEUMONITIS*

By THOMAS A. GROOVER, M.D., D.Sc.,
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In a paper[1] read before this Section in 1921, we called attention to certain clinical phenomena associated with demonstrable pleuropulmonary lesions which we believed were the result of exposing the chest to roentgen rays for therapeutic purposes. Since then we[2] and a number of other observers have adduced evidence which undoubtedly substantiates our original conclusions. Desjardins[3] was the first to call the condition pleuropneumonitis. By prefixing the name of the causative agent such a designation would appear to be appropriately descriptive, and would harmonize with the generally accepted roentgen nomenclature.

INCIDENCE

The frequency with which roentgen pleuropneumonitis occurs in the course of treatment of chest lesions is not yet known, mainly because it is not routinely sought for, and also because of the difficulties which may occur in establishing a diagnosis. While it is probably not a common sequence, it is doubtless much more com-

*Read in Section on Radiology, Southern Medical Association, Twentieth Annual Meeting, Atlanta, Georgia, November 15-18, 1926.

mon under prevailing methods of treatment than is generally believed. Its incidence will not be established until careful clinical records and frequent roentgen examinations of the chest are made in a large series of cases over long periods of time. The time element is important, because it may be the determining factor in establishing a diagnosis.

MECHANISM AND CONTRIBUTORY ETIOLOGIC FACTORS

In a broad sense, the occurrence of roentgen pleuropneumonitis, and its degree, are doubtless dependent upon the dose delivered to these structures. It is noteworthy that these lesions had not been observed prior to the modifications in technic which came into vogue in this country about seven years ago. These modifications consisted in the use of higher voltages, increased filtration, increased skin target distance, larger portals, and increased time of exposure. The circumstantial evidence is strong that these modifications are directly related to the occurrence of these lesions. All of them possibly play a part but not to the same degree. Our experience coincides with that of Desjardins and others that high voltages and heavy filtration are not essential to their production. The last three factors, namely, distance, area and time, seem to be the most important. The thickness of the patient and the thickness of the thoracic wall are important factors in determining the amount of radiation that reaches the pleura and lungs, and if not reckoned with in computing dosage may determine the occurrence or non-occurrence of pleuropulmonary changes. If the dose reaches or passes the point of skin tolerance, the roentgen pleuropneumonitis is more likely to result. We have not observed pleuropulmonary changes in any case in which there was not a definite skin erythema. In nearly all cases the reaction has approached the second degree, invariably subsiding, in the course of three to six weeks. This does not necessarily indicate that reactions may not occur in cases in which there has been no erythema. It is probable that dosage could be so distributed as to produce serious lung lesions without causing any acute skin reaction.

We are inclined to believe that conditions which favor physiological or mechanical pulmonary atelectasis may also predispose to the occurrence of pulmonary phenomena, and possibly contribute to their permanence. Such conditions are met in debilitated patients, of the asthenic habitus, who have recently undergone radical breast operations. This will be referred to later in discussing the pathology and roentgen signs.

In the experience of Desjardins,[3] pleuropulmonary changes have never been observed to follow the first series of treatments, and are seldom seen until after the third series. It is, of course, quite logical to suppose that repetition of exposure would contribute to their production, but, strangely enough, in our experience such changes have generally followed the first series, notwithstanding a close similarity between our technic and that of Desjardins. This should serve to put one on his guard in repeating treatments without carefully checking up on possible pleuropulmonary changes, especially if there has been a definite skin reaction and the chest walls are thin.

Evans and Leucutia[4] have attempted to estimate the dosage required to produce pleuropulmonary changes of temporary and permanent character. Briefly stated, their conclusions are as follows:

> A single dose of less than 100 per cent skin unit dose produces no demonstrable changes. A dose of 40 to 100 per cent skin unit dose repeated three or four times at intervals of two to six months may cause infiltration with possibly fatal results; a single dose of 100 to 140 per cent skin unit dose may cause infiltration which usually clears up, but if it exceeds 140 per cent the changes are permanent. If a dose of 100 to 140 per cent skin unit dose is repeated for the second time before infiltration due to the first exposure has had time to clear up, entire loss of lung function may follow, and if extensive will prove fatal. A dose of 100 to 140 per cent skin unit dose, if repeated twice over the same parts of the lungs, will cause fibrosis in about 80 per cent of the cases, and if repeated three or four times fibrosis will appear in every case.

PATHOLOGY

Comparatively little has been contributed to the pathology of roentgen pleuropneumonitis from post mortem studies on human subjects. Hines[5] reported the findings in two cases which had been given a large amount of radiation over the chest for malignant disease. Pulmonary metastases were present in both cases which to some degree vitiated conclusions as to what effect, if any, the radiation might have had on normal pulmonary tissue. He was probably correct, however, in believing that in one of the cases the proliferation of connective tissue in the alveolar walls with resultant decrease in air space was due to the treatment administered. Two cases cited by Rose[6] in which pleural effusion followed roentgen therapy of the chest are even less convincing with respect to the role which the treatment might have played in its

production because of the fact that in both instances there were other confusing pathological processes.

Davis,[7] however, in a series of experiments on dogs and rabbits, has observed changes which doubtless closely parallel those occurring in human subjects. On gross examination the irradiated areas were of firmer consistency than normal lung, were non-expansible, and cut with increased resistance. The surface of the lung corresponding to the irradiated area presented a reddish-blue discoloration, and the cut surfaces in many cases appeared smooth and the normal lung markings were obliterated. The gross appearance often resembled marked passive congestion or hypostatic pneumonia.

Microscopically the pathologic picture of the acute stage of the affection is that of marked edema and congestion, the air spaces being filled with coagulum and desquamated epithelial cells, and the capillaries of the alveolar walls packed with red blood corpuscles, without an excess of leucocytes. These changes were followed by a cellular proliferation, especially in the alveolar walls. Increase in the connective tissue occurred around the bronchi and blood vessels, and the walls of the blood vessels in some cases became thickened, apparently due to an increase of connective tissue, limited largely to the pars media. The lumina of the vessels were narrowed but not obstructed. A superabundance of connective tissue characterized the chronic stages of the affection. Atelectasis could not be excluded. Pleurisy with increased fluid and adhesions was observed in only one animal and is presumably not of common occurrence.

SYMPTOMS

A restudy of our cases of roentgen pleuropneumonitis indicates that the symptoms and roentgen signs become manifest a somewhat longer time after exposure than we originally reported or than has been reported by others. They may begin three or four weeks after a course of treatment, but commonly do not attract attention until about eight or ten weeks after treatment. In the early stages the patient is apt to think that she has "taken cold." The predominant symptoms of roentgen pleuropneumonitis are an irritative unproductive cough, and a variable degree of respiratory embarrassment dependent on the extent of the lung lesion. The cough is apt to be harassing and is frequently paroxysmal in character. Patients may complain of a sense of discomfort in the chest and perhaps have some fugitive pains, but the cough is their chief source of annoyance. They do not feel ill, but may find it necessary to restrict their activities on account of the increase of dyspnea which exertion occasions. These symptoms hang on for weeks, months or years. They tend to diminish slowly in intensity as the uninvolved lung structure becomes adapted to new functional requirements, but may continue indefinitely to a varying degree, depending upon the extent and permanency of the structural changes.

ROENTGEN SIGNS

These naturally vary to some degree with the intensity and extent of the reaction. We have not studied cases in which both lungs were involved, but when the radiation has been fairly evenly distributed over one side of the chest as is commonly done in the treatment of mammary carcinoma, the pulmonary reaction, if it occurs, usually presents a fairly characteristic appearance, and follows a definite course. In such cases, definite roentgenologic signs do not become manifest until from two to three months after exposure. At this time there is diminished expansion of the affected side, the diaphragm on that side is elevated and immobile, the heart and mediastinal structures have shifted toward the involved side, and a distinct fog will be observed in the lung parenchyma adjacent to the hilus which resembles in appearance the infiltration seen in influenzal pneumonia. This infiltration spreads rapidly and in the course of three or four weeks may involve the entire lung, at which time the symptoms will have reached a maximum degree of intensity. The increase in density is apt to be more or less patchy and its distribution follows no fixed rules. The heart and mediastinal structures shift still farther toward the affected side and the diaphragm becomes more elevated and remains fixed. At this stage there is generally a demonstrable compensatory emphysema of the opposite lung. Having reached its height, the infiltration then slowly begins to clear up, and as it progresses, evidence of pleural adhesions to the parietes or diaphragm become manifest. Pleural effusion has not been observed in any case in which we were sure of the diagnosis. In cases of the severity above described, it is to be anticipated that improvement will progress for a year or more. The lung parenchyma gradually returns to a normal appearance, but some elevation of the diaphragm and retraction of the heart persist, and expansion of the affected side is apt to

remain somewhat restricted. Improvement in symptoms takes place concurrently with the improvement in the roentgen appearance and restoration of lung function. More or less cough and breathlessness on exertion may persist indefinitely, but the general well-being of the patient is conserved. It is, of course, to be presumed that in cases in which the pleuropulmonary reaction is slight the course of the affection will be shorter, and likewise in cases in which the reaction is greater there is a proportionate danger of permanent structural changes and chronicity of symptoms.

We have observed two cases having permanent pleuropulmonary changes, which we believe to have been caused by roentgen rays, in which spontaneous fractures of several ribs occurred three and four years respectively after exposure. Such an occurrence naturally casts doubt upon the nature of the pleuropulmonary pathology, but a careful consideration of all of the facts has led us to the conclusion that in these cases the rays not only caused the pleuropulmonary changes, but that they also led to changes in the overlying ribs which increased their fragility to such an extent that they cracked under the stress incident to the retraction of the thoracic wall. It is our intention to discuss this phase of the subject in a subsequent communication. It is possible that the pleuropulmonary changes and the clinical course following repeated small doses might differ materially from those produced by one or two relatively large doses, but we possess no data to substantiate such an assumption.

An interpretation of the pathology of roentgen pleuropneumonitis in the light of the roentgen signs is of considerable speculative interest. We are inclined to believe, regardless of other co-existent changes which may be present, that atelectasis plays a prominent role in the production of the roentgen signs. We are unable on any other hypothesis to explain satisfactorily the marked elevation of the diaphragm and the shifting of the heart toward the affected side. The changes in lung architecture as observed roentgenologically are not at all inconsistent with such a theory.

DIAGNOSIS

The diagnosis of roentgen pleuropneumonitis will ordinarily offer little difficulty, provided careful clinical records are kept, and satisfactory roentgenograms of the chest are obtained prior to beginning treatment and at frequent intervals thereafter. The two together in uncomplicated cases form a clinical ensemble unlike that of any other affection with which we are familiar. Difficulties will, of course, arise where there are associated pathological processes in the lung or pleura, and in cases in which there is pleural effusion, or extensive invasion of the lung by a new growth at the time of treatment, it may be impossible to determine with any degree of certainty whether or not roentgen pleuropneumonitis supervenes. However, in cases in which lung invasion by a new growth is slight, and there is a relatively large area of normal lung structure, the recognition of a complicating roentgen pleuropneumonitis is by no means impossible if careful consideration is given to the following points:

(1) The development of roentgen pleuropneumonitis bears a fairly definite relation to the time of treatment.

(2) The spread of infiltration due to roentgen rays is very much more rapid than that due to a new growth.

(3) In roentgen pleuropneumonitis there is commonly an early elevation of the diaphragm and retraction of the heart and mediastinal structures toward the involved side, neither of which occurs in either primary or secondary malignant disease of the lung.

(4) The general well-being of the patient with pleuropneumonitis is much better than it is in patients who have a corresponding amount of lung involvement from a malignant new growth either primary or secondary.

PROGNOSIS

No deaths from roentgen pleuropneumonitis have come to our attention. This does not necessarily mean that they have not occurred, the fatal issue being ascribed to some other cause. We are convinced from our own experience that a fatal outcome is by no means a remote possibility. In several of our cases such an issue would seem to have been inevitable had not the lesion fortunately been limited to one lung. This fortunate circumstance is ascribed to the fact that we do not commonly irradiate both sides of the chest in the treatment of breast carcinoma. On the whole, it may be stated that the chances for life are excellent provided only one lung is involved, and that within certain limits of dosage the chances for restoration of lung function are also good. We have not had the opportunity to confirm these limits as laid down by Evans and Leucutia,

but are inclined to regard them as approximately correct. Roentgen pleuropneumonitis would theoretically enhance the dangers of intercurrent respiratory infections should these occur. On theoretical grounds, it would be logical also to suppose that its presence would predispose to respiratory infections, but in practice we have not observed such a tendency.

PRACTICAL CONSIDERATIONS

The question naturally arises as to whether the possible occurrence of roentgen pleuropneumonitis calls for a modification in the present-day technic of treating thoracic lesions, more especially mammary carcinoma. From our own experience we feel that it does not necessarily do so, but that it calls for an exercise of caution is undoubted. When large areas are exposed at a relatively long focal skin distance for a long period of time, skin tolerance cannot be taken as an absolute measure of lung tolerance. This is true, regardless of the voltage and the thickness or kind of filter employed. It should be an invariable rule in the treatment of such cases to secure roentgenograms of the chest prior to beginning treatment and at intervals of every month or six weeks thereafter for an indefinite period. We feel that in certain cases it may be advisable to take chances of damaging the pulmonary structure in the hope of eradicating the disease for which the patient is treated, but as a rule the aim should be not to exceed 100 per cent of a skin unit dose over two or three large thoracic areas. This would seem to be especially important in the pre-operative treatment of carcinoma of the breast, because it is logical to suppose that it would be hazardous to operate on a patient at or about the time roentgen pleuropneumonitis is developing.

When a 100 per cent skin unit dose has been administered as above described, treatment should not be repeated for at least three months, and then 80 per cent of a skin unit dose should not be exceeded. It seems questionable, in view of the observations of Evans and Leucutia,[4] if it would ever be justifiable to administer a third treatment under such circumstances. Of course, the occurrence of roentgen pleuropneumonitis interdicts all further treatment, certainly for a long indefinite period. The occurrence of erythema following treatment, even though transient, calls for special caution with respect to repeating treatments.

The chief points that we would like to stress in conclusion are as follows:

(1) The occurrence of roentgen pleuropneumonitis is by no means a remote possibility under present-day methods of technic.

(2) It can usually be recognized if sought for routinely and methodically.

(3) The possibility of its occurrence is an added reason for caution with respect to dosage and repetition of treatments.

(4) The possibility of damage to deep seated normal structures by roentgen rays does not nullify their use as a therapeutic agent, but rather lends encouragement to their continued use and calls for further study as to their effects on the various tissues of the body.

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DISCUSSION (Abstract)

Dr. E. C. Samuel, New Orleans, La.—We have had some trouble with pleuropneumonitis. During the last six or eight months we have gone back to the nine inch technic, and have stopped using deep therapy in breast tumors. I do not know that the results will be better than they were, but we are not using deep or short wave therapy any more.

Dr. D. Y. Keith, Louisville, Ky.—The majority of American roentgenologists is proud of the fact that few of us accepted the so-called German high voltage technic advocated six or seven years ago. For this reason few of us have seen pleuropneumonitis as the result of heavy radiation or frequent radiation given with low voltage.

I should like to emphasize the value of a primary film of the chest before treatment of the chest or axillary lymph node area is begun. It is very essential in malignant cases, as it gives us an indication of metastasis in the lung, and is invaluable for reference to determine changes that occur after irradiation.

We have had only a few cases of pleuropneumonitis in which the amount of involvement was limited. We have had no fibrosis involving the entire chest like that shown by Dr. Groover. Local changes in the lung do frequently occur and can be demonstrated on the

roentgen film, in which no massive involvement of the entire lung occurs. This was demonstrated to us in the early days of high voltage treatment, with 200 kilovolts. A patient had complete regression of a tumor of the mammary glands after needling with radium, x-ray being used over the regional lymph nodes. Six weeks after the second series of radiation and three months after the primary radiation, a localized fibrosis was seen in the upper portion of the lung. The question arose whether the area of increased density was not fibrosis in the breast as a result of needling the breast with radium, which had been placed directly in the mammary gland. By placing a flexible lead wire around the mammary gland and making another film, it was definitely shown that the fibrosis was in the lung tissue above the breast that was surrounded by the lead wire.

We agree with Dr. Groover that damage to tissue can be obtained with a voltage of 100,000 as well as with 200,000 if enough time is given to any particular area.

Dr. Groover (closing).—I would like to emphasize the fact that voltage is not the important factor in producing the pleuropulmonary changes which I have described and illustrated by slides. The important factors which contribute to their occurrence are the employment of large fields, relatively long skin focus distances, and prolonged time of exposure.

ROLE OF FOCAL INFECTION IN THE CAUSATION OF GASTRO-INTESTINAL DISEASE*

By JOHN L. JELKS, M.D., F.A.C.S.,
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This is a subject so vast in its scope, so much in need of thought and scientific research, that a large volume might now be written upon it, which in the years to come would be a marvel for its lack of understanding. Discoveries are now being made and happily the scientific mind is awakening to this star of promise.

A few years ago sinus block, purulent tonsils, dead teeth and pyorrhea pockets were of no special importance to the most learned physician and pathologist. I recall an autopsy performed by Professor Stokes in Baltimore the summer of McKinley's assassination. The subject was a young man of perfect physical appearance, whose death occurred a few hours after the onset of symptoms from hyperpyrexia. No disease could be found except a violent streptococcic endocarditis. Search was made and no external wound or source of the infection was found. Yet I remember distinctly that there was no inspection of teeth, tonsils or sinuses, whereas these would be inspected first today. I mention the dear doctor's name in this connection, because he was known for his learning and thoroughness. This case illustrates a point for discussion, namely, some of the statements I shall make today will be considered, perhaps, radical beyond reason. Some three years ago I caused laughter when in the discussion of the subject of colitis I related this fact that I began my inspection in the mouth and thence went downward, though I was a proctologist.

In the study of many and varied cases covering a period of several years, very few diseases either surgical or non-surgical have been observed by me in which focal infection failed to play an important part, and even gastric and intestinal cancer are not excepted. For the sake of brevity, I will recount a few important conditions which I am usually able to trace directly or by strong suggestion to a primary focus of infection: gastric and duodenal ulcer, cholecystitis and cholelithiasis, empyema of the gall bladder, intestinal cancer, chronic enteritis except that which is parasitic, appendicitis except that in which foreign bodies are found, colitis except parasitic and bacillary cases, pericolic veils or so-called Jackson's membrane, proctitis and cryptitis unless they are parasitic, syphilitic or gonorrheal.

Some of you may recall cases enumerated in this list in which no focus of infection was found. The contention of negative findings is never conclusive, and only positive findings are worth anything to statistics in these conditions. I have seen cases in which the focus was not found by able gastro-enterologists and others, but I had the advantage of a later study when the focal origin seemed conclusive. My contention upsets some pet theories such as the seasonal recurrence of peptic ulcers, also of the so-called nervous diarrheas and indigestion, and that most puerile inclusion in our nomenclature, "mucus colitis."

The seasonal recurrence does not negative the focal origin, but should make us more diligent in searching for and cleaning up a focus before the recurrence. The same focal origin or cause of the diarrhea is capable of making one nervous, and the resulting intestinal irritation and inflammation will probably cause many and varied nervous manifestations, and any colitis will cause the glands to secrete an excess of mucus.

It has been my custom to select for immediate

*Read in Section on Gastro-Enterology, Southern Medical Association, Twentieth Annual Meeting, Atlanta, Georgia, November 15-18, 1926.

operation only those cases presenting emergency indications, while in subacute appendicitis and chronic gall bladder infection I deem it to the best interest of the patient to have these foci cleaned up first. Recently a patient was thus advised, and she informed me that another surgeon had made the same diagnosis of gall bladder disease and a subacute appendicitis, and had also observed the very serious necrosis which surrounded three teeth, but he advised her not to disturb that "sleeping lion" until the gall bladder was removed. I could not agree to this and she appealed the case to an internist, who settled it as I had advised.

I have seen many cases of pure streptococcic proctocolitis. The appearance through the sigmoidoscope seems to me so characteristic that I flatter myself that I am able to single them out without a microscope or culture, which one or both later I seldom omit. The mucosa is very red in these cases if they are acute. Less mucus is secreted than in parasitic cases, but in some of them dehydration is quite rapid. The hemoglobin is not so disturbed and a high leucocyte count may be observed. Certainly always an increase of leucocytes is seen in acute cases, which reverses the rule for uncomplicated amebic infections. Another fact is that in several such cases I have encountered exacerbation of the condition and of symptoms when these foci have been attacked. It would appear, therefore, that my surgeon friend was not far away in his reference to the "sleeping lion." However, I take issue with him on the ground that he will not cure his patient before he eradicates them. There continues the constant stream of infection, which gives preference to the injured organs. If these foci remain, adhesions are more liable to be reestablished and perhaps troublesome new ones to form.

I have chosen one illustrative case to present in this connection.

This gentleman was referred to Base Hospital 88 with a diagnosis of amebic dysentery and rectal stricture. The former he did not have and the latter was spastic. Trouble began in 1918, with headaches and discharge from the nose, following which he had twenty operations for the relief of the nasal discharge. In 1921, he began to have gastric disturbance and trouble with hemorrhoids for which hemorrhoidectomy was done, without any improvement. Following the hemorrhoidectomy the diagnosis of rectal stricture was made. At the time of admission to the hospital, examination of the nose showed a thick, purulent discharge from the antrums and ethmoids; the x-ray showed considerable increase in density in all sinuses; proctoscopic examination showed spastic narrowing of the rectum, and the sigmoidoscope was inserted with some difficulty. There was a marked spasticity and there were many superficial ulcers, irregular, ragged and not undermined. They were covered with a dirty yellowish gray membrane, and bled profusely when this membrane was removed. Smears for ameba were negative, and also for tubercle bacilli. Culture showed streptococci, *B. coli; B. capsulatus* and *B. bifidus.* X-ray showed nine abscessed teeth. A barium enema showed the lower 2.5 inches of the rectum almost completely obliterated with considerable dilatation just above this point, and marked narrowing of the sigmoid and colon.

The treatment consisted of extraction of all abscessed teeth. After each extraction the patient suffered from severe intestinal hemorrhages. A radical antrum operation was performed following which the patient had a severe intestinal hemorrhage. He was given a colonic irrigation of mercurochrome, 1-500 in normal saline solution daily, 0.9 gm. neo-arspenamin weekly; and 3 gm. of sodium iodid intravenously every second day. This treatment was carried out for some time with 60 days interruption during the months of July and August. The patient was seen Feb. 16, 1926, at which time he had gained 37 pounds in weight, was having no trouble with his bowels or with his sinuses, and he made the trip from Muskogee, Oklahoma, to Memphis, Tennessee, for an examination to determine if he was justified in going to work at that time. He stated that he was feeling better than he had been since 1918, and so far as I know there was nothing wrong with him. The colitis at this time had disappeared, the spasticity was all gone, and so were the strictures. He was apparently a normal man again.

While a rectal case was being prepared for me to operate in a clinic held in Indianapolis, by the American Proctologic Society last spring, I made these observations concerning mouth and other focal infections above.

"This invalidism probably originated in a badly infected mouth. When medical science teaches mankind the dangers of just two micro-organisms, namely, the streptococcus and the colon bacillus, whose normal habitat is the ailmentary tract, and learns to control their ravages in the human host, our longevity will be raised to one hundred years and our youth to half a century. We mix streptococci with our food and convey them to the most vital recesses of our organism. They open the portals of our intestinal mucosa, and invite the colon bacillus to enter. Together they enter our blood vessels and play havoc in the vascular walls, where deposits of reactive products make them insecure, less resistant. The intestines are thus less capable of performing their digestive function, and in cases of proctocolitis from whatever primary cause, these collateral infections add insult to injury."

Cases of this type have undoubtedly increased during the last few years, and there must be a reason. This phase I should like to have discussed. I should like to know whether there are actually more streptococcic mouth and throat infections than in former years. I trust that the pediatricians will note these observations, for the origin of many infantile diarrheas can be traced to mouth and throat infections, and with this idea in mind, infant mortality may

be reduced. But education of the mothers, and closer inspections by the family physicians will go a long way toward controlling these cases before infants are hopelessly dehydrated. These infections may or may not be primary factors in amebic cases. Indeed, they may play an important role.

In 1914,[2] in discussing the Lane and Coffey theories of the etiology of pericolic veils and membranes I advanced a new theory as to the cause of these veils. I expressed the view that only those membranes which came off from the parietes were prenatal, and that the so-called veils or Jackson membranes were caused by streptococcic infection which came from mouth, throat and sinus infections, and set up a colitis. The infection thus established, extended through all the coats of the intestines, setting up a transudative inflammatory deposit, which resulted in the development of these adventitious membranes. This theory I hold today, and I am more convinced that the contention then made was correct.

DIVERTICULOSIS

A disease said to occur in the fat and forty, has not been viewed as I view the condition from an etiologic standpoint. The first case to be illustrated has about the history that you would expect.

For years the patient suffered from hemorrhoids and defective intestinal elimination, pyorrhea alveolaris, chronic tonsillitis, dead, abscessed and crowned teeth, neuritis, chronic colitis and a spastic colon. His rectal and sigmoid mucosa presented about the appearance of a turkey's snout on a cold and frosty morning. He had the four factors which enter into the causation of his remarkable condition, namely: chronic mouth and throat infection, infected, ulcerated and spastic colon; defective intestinal drainage, and was a big eater and led a languid life. To consider such a pathological condition of the colon with amebic ulceration is to doubt recovery.

THE SPASTIC COLON

I have never seen a classical spastic colon, in which there was not found an infection above, or the history of such an infection which had been cleared up. It is in this class of cases that we find the most miserable chronic complainers. They are never well and often receive less sympathy and consideration than they deserve. Some have become drug addicts, and others were the psychic gland therapy converts.

I have often been confident that a cryptitis resulted from the pus coming down from pyorrhea, pussy tonsils or sinuses and finding lodgment in the crypts of Morgagni. Pruritis may then become a natural sequence, as also perirectal infections, abscesses and fistulae, ulcerations and hemorrhoids. These conditions and cases have been of intense interest to me; so much so that I have hoped others hearing the discussions which follow will seek the truth concerning their origin.

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DISCUSSION (Abstract)

Dr. George M. Niles, Atlanta, Ga.—There is but one phase of the subject of focal infection that I wish to discuss today. That is focal infection arising from static bile in the gall bladder. Empyema of the gall bladder was mentioned in the paper. We can have the same results without empyema. Focal infection can come from a collection of pathologic bile, not necessarily with gallstones. The results of such an infection are very widespread and varying in character. Sometimes they manifest themselves in gastric and intestinal flatulence which gives rise to the noted epigram to watch out for gall bladder trouble when the patient is fair, fat and forty and belches gas.

Then we have the other disturbances which are sometimes called dyspeptic. We have the heart-burn, the sour and acid stomach, distress after meals and all those manifestations of indigestion. We can also have migrain of varying intensity. Bronchial asthma may come from an infected gall bladder and improve or disappear when the infected gall bladder is cleaned up.

Arthritic conditions also may be due to a gall bladder which does not function properly.

You will remember that in mythological lore one of the twelve tasks of Hercules was to clean up the Augean stables. At that time King Augeas had over three thousand horses and, being very careless about sanitary affairs, his stables had not been cleansed for over thirty years. The legend says that Hercules turned into those stables the rivers Alpheus and Peneus and in twenty-four hours the stables were thoroughly cleansed and that terrible stench disappeared.

Now, many of our patients have a miniature Augean stable that they carry around with them in the form of a dirty and infected and poorly functioning gall bladder, which by our efforts we can cleanse for them.

Dr. J. A. Witherspoon, Nashville, Tenn.—For many of the gastro-intestinal diseases focal infections are responsible: colonic infections, infections of the gall bladder, of the teeth, and so on. I think we are not paying enough attention to colonic infections. Very few people really empty the colon. If after having their normal bowel action they would take an enema, they would find that they passed more fecal material which had been retained in the colon than they had originally passed. There is no doubt that many infections come from this source. The gall bladder is also a grave source of infection.

Dental infections which are very important cannot be diagnosed by any dentist living.

I do not think we have paid enough attention to focal infections coming from the prostrate.

Dr. Max Einhorn, New York, N. Y.—I do not doubt

that focal infections play some part in diseases of different natures, but very often nowadays we pay too much attention to the removal of these focal spots without considering that sometimes we may be able to do something for the patient by strengthening the general forces of the organism. Now a living being is different from any other substance of organic matter not living in that dead organic matter can be attacked by small micro-organisms if it is not protected very thoroughly. The living organism protects itself. Trees usually do not die of infections, but keep on growing for many years and ultimately get old, and then they begin to show signs of infection.

You will see a parasitic growth developing on the stem or trunk of the tree which shows that with the beginning decay of the living matter there comes the development of some micro-organisms which are stronger, being new and not old, and they attack that other living organism which is becoming decrepit. It is the same way in our own organism. If you have a bad tree that is not so very old and you want to protect it, you ask the aid of a forester. At first he ascertains if the soil is all right, and if he finds that the soil is poor, that the nutrition of the tree is interfered with, he advises fertilizing material at the root and in the soil, and after a while you will see the tree beginning to improve, and the infection ceases of itself, in many cases.

In our organism we should certainly first look around and see whether the body is in good condition; whether we keep up nutrition in the right way; whether the patient is getting the right diet and whether he takes enough food. If there is something wrong we should first try to improve those deficiencies which we discover. An invalid with a chronic disease from which he had been suffering for years may have had an insufficient amount of nourishment. If we increase the amount of food that patient becomes a different being and is able to fight his disease without the aid of surgery.

These points are of great importance. You will find that a great many patients suffering with chronic constipation, colitis, and so forth, will improve of themselves with good nutrition.

If we have discovered a diseased gall bladder and examine the bile, we can see the micro-organisms in great numbers, and if we have localized the spot of infection, and it cannot be improved by general medical means, then it is a surgical case. But I would say, first try all means that you have at your disposal to give the organism a chance to fight the disease. If it appears unsuccessful, if the disease has gone too far and it seems certain that the spot can be removed, surgery should be applied.

Dr. M. F. Arbuckle, St. Louis, Mo.—Dr. Jelks has made statements regarding the etiological relation of nasal suppuration to gastro-intestinal disorders, which probably are not generally accepted. I think he is right and have for some time held this point of view. We are, of course, unable to explain to our satisfaction many questions which arise in such a consideration, but my conclusions are based on clinical results, which, if correctly interpreted and repeatedly seen, offer strong evidence.

To me it is readily conceivable that a constant flow of pus and bacteria down the esophagus, which usually occurs in empyema of one or more of the nasal sinuses, should sooner or later cause irritation in the gastro-intestinal tract, and finally result in lesions such as ulcer or chronic inflammation.

We are not sufficiently well acquainted with the nerve supply of the gastro-intestinal tract to discuss it with assurance. We do know, however, that irritation of the nasal ganglion, with pain in the head, is sometimes associated with discomfort, or even severe pain, in the region of the stomach, and nausea and vomiting. We also know that such pain and nausea frequently can be stopped by cocainization of the nasal ganglion. This picture may be the result of irritation of the nasal ganglion by changes in the sinus walls secondary to chronic sinus disease. It is conceivable to me that the function of the secretory and motor nerve supply of the stomach and intestines may be disturbed reflexly by a similar process.

It has been proven repeatedly at the St. Louis Children's Hospital that infection of the upper respiratory tract and ears of infants and children cause vomiting and diarrhea.

Dr. John J. Shea, Memphis, Tenn.—We have found two classes of focal infections, especially in children: one is the intestinal, the patients showing dehydration in the winter months following the influenzas that have been due to acute infections of the mastoid. Dr. Arbuckle, Dr. Marriott and many men in pediatrics and rhinology have had the same experience. These cases are not typical purulent mastoids. They are merely acute streptococcic infections of the infantile mastoid antrum. They will not clear up until we have drained the mastoids. It does not take a surgical operation such as is necessary for the acute purulent infections and suppurations of the mastoid. Sometimes a simple drainage by myringotomy can be accomplished, but often the mastoid antrum must be drained. In the infections that involve the kidneys more than the intestines the children do not have a dehydration but they are put on fluids. Those infections as a rule are staphylococcic, and after being drained the patients return to their normal weight.

This work is at present in its infancy.

THE PROPER RELATION BETWEEN THE HEALTH OFFICER AND THE PHYSICIAN*

By FELIX J. UNDERWOOD, M.D.,
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In order that we may properly understand this question, we must first clearly recognize the relation of the physician to his patients and to the state. Once we get a thorough understanding of these relationships, then the relationship of the health officer to the physician can be readily understood.

The success which any health officer attains in the performance of his duty will be very largely dependent upon the support and cooper-

*Read in Section on Public Health, Southern Medical Association, Twentieth Annual Meeting, Atlanta, Georgia, November 15-18, 1926.

ation which he receives from the physicians in the community over which he has jurisdiction. This is an axiom which all health officers must recognize and observe.

Between the physician and his patient there exists the most intimate and confidential relationship. So well is this recognized that our legislatures and courts have established the right to hold inviolate information received by the physician in the course of his professional contact with his patient. So long as the welfare of the community is not involved, or the health of others is not hazarded, then the physician is under moral and legal obligations to hold sacred his information.

In his relation to the state, we find a very close and binding obligation. The physician owes his right to practice his profession in the community in which he lives, to the state. The state through its constitutional powers prescribes certain conditions which must be met by the physician before this right to practice can be conferred upon him. The object of this is for the protection of the public against unqualified practitioners who could, if unrestricted, do much harm to those who might be led to commit their health and lives into his care.

The state being satisfied as to the qualifications of the one seeking to practice as a physician, issues a permit or license, but with certain requirements and restrictions, which must be observed by the physician. The state specifically reserves the right to make such changes in these requirements and restrictions as may from time to time become necessary to protect the health and lives of its citizens. It is under these conditions that every physician accepts the license to practice his profession.

Among the requirements which the state imposes upon the physician are the reporting of births and deaths and the reporting of certain diseases which are communicable from one person to another. Among the restrictions are the prohibition of the performance of certain operations and the administration of certain drugs, the object of these requirements and restrictions being for the public good.

We emphasize these things for the purpose of bringing out this fact: that the state reserves the right to say when information obtained by the physician in the course of his professional contact ceases to be held confidential, but is required to be reported to the state for the public welfare. The duty of the state is two-fold, the protection of the individual and the protection of the public at large. When these conflict, then the protection of the public takes precedence. In other words, the theory of "the greatest good to the greatest number" predominates.

When the physician discovers during his professional work a case of any communicable disease, the state requires that he, as an agent of the state, shall immediately notify the state of this fact in order that the necessary steps may be taken to protect the rest of the community.

With this comprehension of the relationship existing between the physician, his patients and the state, we are in position more intelligently to consider the relationship between the health officer and the physician.

The health officer is the official representative of the public and of the state. He is appointed for the purpose of safeguarding and protecting the health and lives of the citizens under his jurisdiction. As the representative of the public and the state, he is the official designated by the state to receive from the physicians the various reports required of them by the state.

In the performance of his duty, the health officer is required to see that all requirements promulgated by the state, or by any subdivision thereof, through power delegated to it by the state, for the protection of the health and welfare of the citizens, are faithfully and impartially carried out. This duty brings him into very close relationship with the physician, and the success which any health officer attains in the performance of his duty will be very largely dependent upon the support and cooperation which he receives from the physicians in the community over which he has jurisdiction.

This relationship calls for a keen understanding by the health officer of the problems of the physician; it calls for a bond of good fellowship between them; for a knowledge of the part that both have to play in the protection and preservation of health and lives of those in the community of which they are a part, this latter being the object which both of them have in view.

While the health officer, by law, is granted more powerful authority than practically any other individual, yet he should realize that it is only to be used in extreme cases, and only when the use of more tactful measures fails. He should always remember that persuasion, rather than force, accomplishes more satisfactory results.

The health officer in his dealings with the physician should be extremely tactful. Instead of antagonizing him, he should be able to show

how they can be mutually helpful to each other. He should realize that the average physician has not made a special study of public health problems, but has been more concerned with the effect and the cure of disease in the individual. Therefore, he should be prepared to explain, if necessary, the reason for the public interest in matters where he is called upon to intervene. He should make the physician feel that his advice and aid are always at his service and that he desires to protect his interest as well as that of the public at large.

The health officer in his dealings with the public should never lose an opportunity to impress the fact of the important part which the physician plays in the general welfare of the community. He should especially emphasize the importance and necessity for the individual to consult his physician in order to keep well rather than to wait for sickness to come and then expect a cure. He should, in other words, advocate preventive medicine, which will undoubtedly be the practice of the future to a larger and larger degree.

In a word, the relationship of the health officer to the physician should be one of friendliness, mutual helpfulness and genuine wholehearted cooperation in everything which pertains to the health and prolongation of the lives of the citizens in their community, because it is only in this way that each of them can best succeed in the performance of the duty that devolves upon them.

The medical profession is solidly behind the tactful, well trained, practical, health officer. The relation between the medical profession and the health officer should be most harmonious. Of course, we all know that this is not always the case. In some instances the blame is to be attached to one side, and in other instances, the other. Given a competent, conscientious and industrious health officer we may expect the hearty cooperation of the rank and file of the physicians under his jurisdiction. Occasionally this end is not accomplished on account of some unfortunate trait in the personality of the health officer. He may be devoid of tact, and antagonize the physicians with whom he comes in contact, or he may be too much impressed with the authority of his office, and gain the ill will of the practicing fraternity by posing as an autocrat.

It is right and proper that the health officer should use the authority of his position to compel the cooperation of those members of the profession who are either too lazy or too indifferent to meet the routine requirements of the state, such as the proper reporting of the births and deaths, and the quarantining of contagious diseases. It is the duty of the health officer to see that all of the physicians comply with the laws on this subject. Hasty and ill-considered action taken against the physician who neglects these things occasionally when he is pre-occupied with his professional work cannot be condemned too strongly. The physician who continues to neglect the requirements of the law after he has been reminded two or three times deserves no further leniency. We know of some physicians who boast that they do not make the required reports unless they care to do so. Fortunately the number of these men is small. Health officers who do not prosecute them are either neglectful or cowardly. In the end they will win the respect of both the physician and the public at large if they compel this negligible number of the profession to meet the requirements of law.

The duties of the health officer in a large community are so manifold and so exact that they require the full-time services of a competent man. Compensation for this work should be sufficiently satisfactory to attract to it the men of better qualifications. If a low wage is paid we may expect to have the place filled by some poorly trained officer. The administration of public health on that basis is worse than having no department at all. Such a man, poorly equipped and ill-trained, will not have the respect and cheerful cooperation of the physicians in the community. The proper administration of public health should be upon a high plane by the best qualified executive obtainable for the position.

The best dollars a county can spend are those invested in a full-time county health department.

DISCUSSION (Abstract)

Dr. C. C. Bass, New Orleans, La.—I have been very deeply interested in questions of public health for a number of years, and particularly during the last few years, from the standpoint of medical education. Preventive medicine, including public health activities, and also prevention of diseases as applied to the individual, is here to stay. The medical profession is either going to furnish this kind of health service or it will be furnished by some one else. A more enlightened people will certainly demand it more and more.

I believe that a part of the training of every medical student should include the rules and regulations with regard to reporting sickness, births and deaths. Every student when he graduates should know what the duties

of the profession in his state are with reference to its health agencies, and how to perform them.

Not only should the student, when he graduates, know his duty with reference to the health of the community, public health, but he should also recognize his duty in prevention of disease in the individual. He should realize that making periodical health examinations is a part of the service which he is prepared to offer and he should practice prevention of disease in the individual just as he does curative medicine.

Finally, a subject which I hope to see the medical profession pay more attention to, is that of oral hygiene. The examination of patients should always include proper examination of the mouth and teeth and proper advice should always include advice thoroughly to cleanse the mouth and teeth one or more times each day, always including one time just before retiring at night. This is one of the most important things that an individual can do for the preservation of his health and promotion of longevity. A large part of the service of the medical profession is for the purpose of promoting health and longevity, therefore due consideration should always be given to oral hygiene.

Dr. J. A. Hayne, Columbia, S. C.—The health officer should be a physician so that he may understand how physicians feel toward each other. I can not see how a health officer who is not a physician could understand the intimate relationship which exists in the medical profession.

The point that Dr. Bass brought out is the most important of all, if we are to have a proper relationship, namely: during the four years the man is at college he should be taught his relationship to the public. He is taught for four years his relationship to his patient, but is taught nothing whatsoever regarding his relationship to his community and the family of the patient.

Realizing this fact nine years ago I took it upon myself as a State Health Officer to give to my medical college and department lectures, on what? Not on preventive medicine, because they have a good course in that, but to the seniors who were going into the world to practice medicine, lectures on public health administration, and the relationship between the physician and the public. They are given a thorough examination, both written and oral, on this subject. They are required to make 75 on this subject, and I am required to sign diplomas. I am a full professor and enabled to turn down anybody who does not pass this examination. We ask, "What are the functions of the U. S. Public Health Service?" "Where are its bureaus?" and "What duties come under each bureau?" "What are the duties of the State Board of Health?" "What departments are under the State Board, and what are their duties?" "What is a local board of health, and how are the functions carried out?" They also know their relationship to the public when they graduate, and, as I have sent a number to Alabama, Mississippi and other benighted states, I feel I am doing good missionary work!

A THORACIC SYNDROME ACCOMPANYING INCREASE OF ABDOMINAL PRESSURE*

By J. Birney Guthrie, M.D.,**
New Orleans, La.

In 1919, I read before this Association a discussion of the changes in the thorax observed in ascites of more or less recent origin. I then described a fairly typical picture of compression of the left lung with the signs which accompany it, that occurred when the diaphragm was displaced upward by increased intra-abdominal pressure. In this series of cases fluid accumulations in the abdomen constituted the cause of the alteration of pressure. It was apparent that the left lung suffered most in the way of upward compression and it was noted that the Kroenig isthmus of resonance at the left apex was diminished in area. The lower border of the left lung was elevated to a position higher than the right and the width of the area at the base of the heart containing the aorta and great vessels was increased in transverse diameter, depending, of course, on the degree of abdominal distension.

The field in which we first made these studies was further worked by means of evacuation of ascitic accumulations in steps. However no pressure readings were made of the fluid within the abdomen through fear of infection. We have had to content ourselves with watching the gradual disappearance of the thoracic syndrome as the ascites was evacuated.

We have been able in normals to produce the same thoracic syndrome, which we then described, by pneumatic compression from without, and to confirm by radiograms the displacement of the diaphragm and diminution of lung volume which occurs.

The Kroenig apex area is a clinical area and cannot be demonstrated by radiogram. It is the line of intersection of the resonant areas of the lungs at the apices with the curvature of the skin and underlying structures. It would seem to be normally symmetrical and not as its discoverer, Kroenig, believed, greater in area on the right side than on the left. Observations

*Read in Section on Medicine, Southern Medical Association, Twentieth Annual Meeting, Atlanta, Georgia, November 15-18, 1926.

**Professor of Clinical Medicine, Tulane University of Louisiana; Colonel, Med. Res., U.S.A.

of this area made continuously during many years furnish data upon which are based the conclusions regarding the symmetry, in point of size, of these two areas.

The study of the effect of the various phases of pregnancy was most interesting. Twenty-one patients were examined at a stage varying from three months to nearly term. It was apparent that the comparative mobility of the diaphragm on the left side here as well as in the cases of tumor and ascites explained the signs which were obtained: (1) diminution of Kroenig area on the left side anterior and posterior with displacement of the outer posterior boundary of this area from 1 to 3 cm. internal to the tubercle of the spine of the scapula where normally it is found; (2) enlargement of transverse mediastinal dullness at the base of the heart in front; (3) elevation of the apex of the heart; (4) elevation of the left posterior and inferior lung border to a point higher than that of its fellow on the right. These phenomena were of gradual development and occurred in all cases excepting those women whose abdominal walls permitted the uterus to lie in a position of extreme anteversion, the so-called *"spitz bauch."*

The determination of this mobility of the left diaphragm apparently furnishes the most satisfactory explanation of the preponderance of the left anterior presentation of the vertex. Satisfactory explanation of this has heretofore been lacking. It is of importance to know that, normally, as pregnancy advances from the third month, the left apex of the lung is compressed gradually by the increase of general abdominal pressure. This is secondary to the increasing bulk of the pregnant uterus. The Kroenig area is diminished on the left, with a corresponding impairment of percussion note at the left apex. If we find the opposite conditions on physical examination, we look for another cause than abdominal encroachment.

We have been able by these studies to build a picture of the modifications that occur under ordinary conditions, and when we find an exception, namely, right-sided shrinking of the Kroenig area, we look for some abnormality in the right lung itself, or in the right pleura and above the diaphragm.

In moderately advanced cases of pregnancy, up to seven and one-half months, as well as in some of the cases of ascites, the change from upright to dorsal lying position was accompanied by the disappearance of the Kroenig area sign. The left area became entirely normal in the dorsal position. This indicates only a diminution of abdominal tension. In the pregnancies before the seventh month, except in the cases with extreme anteversion, and as a result of the change from erect to dorsal position, the uterus was found several centimeters further away (below) from the ensiform cartilage. A corresponding dropping occurred in the apex position of the heart when the patient lay down.

The partial disappearance of the thoracic syndrome in the recumbent position we noted lately. It constituted one of the surprises in the study. It was found that in conditions of rather massive abdominal distension from fluid the left Kroenig area on lying down became, in its anterior aspect, again normally symmetric with its fellow. Also there was a shrinkage in the transverse of mediastinal dullness width, and a dropping of the apex of the heart in the dorsal decubitus position.

Obviously it is not possible to make note of the position of the lungs as regards their posterior and inferior borders in the dorsal decubitus position. There is every reason, however, to believe that these have assumed normal relations except under conditions of very great abdominal tension.

CONCLUSIONS

The author has been able to demonstrate a few rather characteristic points useful in physical diagnosis of the chest which occur in conditions where through increase of abdominal pressure, the diaphragm is pushed upward and inside the thorax from any cause within the abdomen.

(1) The left half of the diaphragm is more freely movable than the right, and as intra-abdominal pressure is increased it is carried upward.

(2) The apex of the heart moves with the diaphragm and often a diameter of one whole intercostal space is traversed.

(3) The Kroenig area is diminished on the left side during moderate general abdominal

compression. The right Kroenig area is then practically unchanged.

(4) The transverse diameter of the vessels at the base of the heart is increased by increase of abdominal pressure. This I believe is in a measure due to a straightening of the aorta, as the heart is lifted. I can attribute some of this widening to a spread of the superior vena cava. The condition is the reverse of the narrowing described by Fossier incidental to lowering of the heart in splanchnoptosis. There is also an increase in the area of cardiac dullness, actual and relative, and the heart is increased in transverse diameter.

(5) Normally the posterior and inferior boundary of lung resonance lies at or near the level of the tenth thoracic spine on the left and at the ninth thoracic spine on the right. When abdominal pressure is increased to a certain point, the left base is found higher than the right. This is so constant a finding as to point in ascites or any other condition of increased abdominal pressure, to a lesion above the diaphragm on the right side if the lung border is found higher on this side.

(6) The external boundary of the Kroenig area posteriorly we find to rest normally on the tubercle of the spine of the scapula on both sides. This line in conditions of increased abdominal pressure moves inward from the tubercle several centimeters, proportionate to the degree of the pressure.

The changes in the apical conditions are the narrowing of Kroenig's area front and back and impairment of the percussion note. These changes are confined to the left apex during a compression of ordinary degree, 40 mm. of mercury. Extreme pressure equal to 80 mm. of mercury applied to the abdominal wall brings about reduction in the right Kroenig area also.

The syndrome above described has been studied in various clinical conditions that bring about increased pressure in the abdomen: ascites; malignancy, with and without ascites; abdominal tumors of various types; pregnancy; and lastly by compression with a rubber bladder held firmly against the abdominal walls and inflated with a pump while connected with a manometer.

1206 Maison Blanche Building.

Southern Medical Journal

JOURNAL OF THE
SOUTHERN MEDICAL ASSOCIATION

Published monthly by the Southern Medical Association, Empire Building, Birmingham, Ala. Annual subscription $4.00. Single copies 35c each.

Entered as second-class matter at the Post Office at Birmingham, Ala., under Act of March 3, 1879. Acceptance for mailing at special rate of postage provided for in Section 1106, Act of October 3, 1917, authorized December 20, 1921.

DR. M. Y. DABNEY, Editor
C. P. LORANZ, Secretary-Manager

Vol. XX FEBRUARY 1927 No. 2

EDITORIAL DEPARTMENT

SOUTHERN MEDICAL ASSOCIATION
Twenty-First Annual Meeting
Memphis, Tennessee, November 14-17, 1927

PROGNOSIS IN CANCER OF THE CERVIX

Carcinoma of the cervix has lent itself rather favorably to study, and sometimes has been found to yield with surprising readiness to treatment. On the other hand, its rapid development to an inoperable stage in the absence of any marked symptoms, is frequently disheartening.

The surgeon or radiologist usually expects the pathologist who examines a piece of tissue to give him not only a diagnosis of its malignancy or non-malignancy, but often asks him to foretell the course of the disease from a microscopic examination of the submitted specimen.

Martzloff,[1] in 1923, after studying a large series of cases, attempted a classification of degree of malignancy according to cell type, and his classification has been followed by a number of pathologists. He divided his cases into squamous and adenocarcinoma, and further subdivided the squamous into three types named from the appearance of the predominating cell. These were (1) the spinal, (2) the transitional, and (3) the fat spindle cell types, and he estimated the first of these as the least malignant, the fat spindle as the most malignant. There was, he said, a high "percentage cure" in the spinal type of cancer, and early occurrence and high percentage of inoperable cancer were observed among the fat spindle types.

Pemberton,[2] in Boston, has recently studied another series of cervical carcinomas, using Martzloff's classification. He was attempting to establish a relation between the treatment of the cancer and the cell type, but concluded that there was no observable relation. He agrees with Martzloff as to the order of malignancy of the types, but suggests that cases having more stroma than cancer tissue respond more favorably to treatment than those having more cancer tissue than stroma.

Plaut,[3] of New York, analyzed a series of cases which appeared at the same time as those of Pemberton, and also reviewed and re-analyzed Martzloff's cases. His short series disagreed with Martzloff's as to the higher malignancy of the fat spindle type. Among nine "cures" he found four fat spindle cases. Plaut observes, as Martzloff and Pemberton also have observed, that all the cell types could be found in advanced carcinoma. He emphasizes Martzloff's statement that none of the patients of any cell type survived, who had true broad ligament involvement, and says, therefore:

"Does not this constitute an uninterrupted chain of evidence that for the greater portion of Martzloff's material one of the chief determining factors in prognosis was given by the rate of penetration, independent from the cell type? For the gynecologist and the practitioner this means that they will continue to rely first on the result of bimanual examination, well aware certainly of the fact that they may mistake a surrounding hard inflammatory mass for carcinomatous involvement."

1. Martzloff: Johns Hopkins Hosp. Bull., 34: 141, 184, 1923.

2. Pemberton, F. A.: Relation Between Treatment of Cancer of the Cervix and the Cell Type. Amer. Jour. Obst. & Gyn., 12: 536, Oct. 1926.

3. Plaut, Alfred: Relation of Prognosis to the Histological Findings in Carcinoma of the Cervix. Surg. Gyn. Obst., 43: 450, Oct. 1926.

Plaut believes that the extent of involvement is the determining factor in prognosis; but that regularity of cell arrangement corresponds to some extent with degree of malignancy, the more irregular cell type being more malignant.

More accurate information regarding malignancy may in time be available from chemical determinations, though at present the known chemical differences between normal and tumor tissue are slight.[4] Quantitative differences of enzymes have been observed in normal and tumor tissues and in different types of tumors,[5] and Warburg[6] has made a number of valuable studies upon the metabolism of cancer. Cancer tissue is capable of converting glucose into lactic acid very rapidly, but the removal of lactic acid which occurs readily in normal tissue, is not so rapid. If slices of tumor tissue are placed in a Ringer's solution containing glucose, large amounts of lactic acid accumulate, which can not be observed around normal tissue. Cancer tissue was noted by Holmes[6] in a short series of cases to be deficient in its content of glutathione, an organic sulphur compound which is present commonly in large quantity in normal tissue, and which plays a part in oxidative reactions. It was almost entirely absent from the cancerous tissue which he examined. But these differences have as yet certainly no bearing upon prognosis in malignancy.

As the patient appears earlier for diagnosis, the physician and research worker will have to devise ever surer means of distinguishing malignant from benign growths, and the more malignant from the less malignant types. Meantime, the surgeon who does not keep abreast of advances in pathology and does not understand its difficulties will demand too much or too little of his assistant, the pathologist, and his own work will suffer accordingly.

4. Wells: Chemical Pathology. Fifth Ed. W. B. Saunders Co., 1925.

5. Falk, K. G.: Chemistry of Enzyme Actions. Chemical Catalogue Co., 1924. Quoted by 4.

6. Holmes, B. E.: Oxidative Mechanism of Tumor Tissue. Biochem. Jour. 20: 812, 1926. Quotes Warburg, Pcsener and Negelein: Biochem. Z., 152:309, 1924.

DIET IN PERNICIOUS ANEMIA

A series of cases has been reported in the recent literature of apparent cure or almost unfailing prompt remission of pernicious anemia, a disease long regarded as incurable. A diet containing large quantities of cooked liver has been advocated. [1] [2]

Extensive animal experimental work has paved the way to treatment of anemia by diet. A number of workers have observed animals with pronounced secondary anemia from bleeding. Rats, rabbits, dogs, and other subjects have been used, and hemoglobin production upon various diets has been studied. Koessler, Maurer and Loughlin[3] made observations upon rats, which indicate that blood regeneration is impossible on a diet which does not contain vitamin A; and that the rate of blood regeneration is a function of the quantity of added vitamin A. Whipple and Robscheit-Robbins[4] in the last few years have developed a method for very accurate estimation of the effect of different diets upon hemoglobin and red blood cell production, in animals in whom had been maintained a long period of anemia. Their work which began in 1920, showed that the amount of hemoglobin regeneration could be modified at will by dietary control.

The hemoglobin of dogs was reduced to 40-50 per cent by periodic bleeding of calculated quantities, and the bleeding samples were measured for total hemoglobin. A good standard diet was adopted, upon which the dogs remained healthy, but upon which hemoglobin production was not marked. Upon addition of given substances to

1. Minot, G. R.; Fitz, R.; Murphy, W. P.; and Monroe, R. D.: Observations on Patients with Pernicious Anemia Partaking of a Special Diet. J. A. M. A., 86:1861, 1926.

2. Minot, J. R., and Murphy, W. P.: Treatment of Pernicious Anemia by a Special Diet. J. A. M. A., 87:470, 1926.

3. Koessler, K. K.; Maurer, S.; and Loughlin, R.: Relation of Primary and Secondary Anemia to Vitamin A Deficiency. J. A. M. A., 87:476, August, 1926.

4. Whipple, G. H. M., and Robscheit-Robbins, F. S.: Blood Regeneration in Severe Anemia. Amer. Jour. Physiol., 72:395, 1925.
Also, p. 408, p. 419, p. 431, ibid.
Ibid, 79: p. 260, 271, 280, Jan. 1927.

the standard diet, increase of hemoglobin and red blood cell production could be measured. Upon addition of liver to the diet, the production of hemoglobin during a two weeks' period was 80 grams more than upon the standard diet. Liver feeding was the most potent factor for sustained production of hemoglobin and red blood cells, and this reaction was invariable no matter how long the anemia had lasted. Varying the quantity of liver brought about a corresponding variation in hemoglobin and red blood cell regeneration.

They then tried the effect of treating their anemias with a number of other foods and drugs. Iron they found valuable in severe anemia. Germanium dioxid, and arsenic were useless. Among green vegetables, spinach was moderately favorable, but in general there was no notable increase of hemoglobin on addition of green vegetables to the diet, and chlorophyll appeared not to increase hemoglobin production even when the organism was under maximal stress.

Both striated and smooth muscle were favorable dietary factors to produce blood hemoglobin in anemic dogs, though smooth muscle in general was more favorable than striated. In the order of potency of certain meats for hemoglobin production they place beef skeletal muscle lowest, beef stomach, pig heart, beef heart, pig skeletal muscle, pig uterus, and chicken gizzard. Two or three hundred grams daily of cooked chicken gizzard produced 60-100 grams per two week period more hemoglobin than the control periods. Kidneys of pig and beef were also very potent, though fish liver and whole fish were almost inert.

Butter and cream in liberal amounts added to the standard diet caused a slight but definite increase in the hemoglobin output. Milk was not favorable, but was put at the foot of the list. This is an observation which should receive attention from pediatricians who treat anemias in infants and young children.

Whipple and Robscheit-Robbins believe, after observing the ease with which hemoglobin regeneration can be controlled by dietary factors, that many types of human anemia may be treated to advantage by dietary control rather than by other methods. They do not agree with Koessler and his co-workers as to the importance of vitamin A for blood regeneration; but one set of experiments is hardly comparable with the other, as the ones use a diet deficient in vitamin A. The others use a basal diet containing sufficient vitamin A for normal nutrition, and add to this the food to be tested. Minot and Murphy,[1] [2] with their forty-five cases of human pernicious anemia, used a full and varied diet, low in fat, to which cooked liver was added.

The work of the last year will probably inaugurate an era of clinical investigation of diet in pernicious anemia. It will be of interest to observe in cases of prolonged liver feeding which show improvement in the blood picture, whether hydrochloric acid has any tendency to reappear in the stomach.

DIURETIC ACTION OF PITUITRIN

Extract of posterior lobe of the pituitary gland is known to have a definite effect in controlling the thirst and diuresis of diabetes insipidus. In a normal subject if pituitary extract is administered alone, diuresis follows.[3] If considerable water is given and then pituitary extract, the opposite effect is obtained. If an isotonic or concentrated solution of urea and potassium chlorid is given before the gland extract, water excretion is still high.[4] In other words, pituitary extract inhibits the excretion of pure water, but not, according to Adolph and Ericson, of water and certain salts.

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1. Minot, G. R.; Fitz, R.; Murphy, W. P.; and Monroe, R. D.: Observations on Patients with Pernicious Anemia Partaking of a Special Diet. J. A. M. A., 86:1861, 1926.
2. Minot, J. R., and Murphy, W. P.: Treatment of Pernicious Anemia by a Special Diet. J. A. M. A., 87:470, 1926.
3. Cushing: Pharmacology and Therapeutics, p. 395, Lea & Febiger, 1924.
4. Adolph, E. F.; and Ericson, G.: Pituitrin and Diuresis in Man. Amer. Jour. Physiol., 74:377, Jan. 1927.

Stehle[1] considers the diuretic action to depend upon an indirect effect upon the kidneys. It is known, he says, that pituitary extract causes increased excretion of chlorids. It also causes increased excretion of potassium, calcium, and phosphorus. These ions are released from the tissues into the blood stream, and the kidney takes water to dissolve and throw off the electrolytes. The effect upon the kidney is secondary to the tissue effect. The cause of the excessive thirst and urine secretion of diabetes insipidus is, he thinks, an electrolyte imbalance in the tissues, which in turn is the result of insufficient secretion of the pituitary gland.

Correspondence

CANCER OF THE STOMACH

Editor, SOUTHERN MEDICAL JOURNAL:

In the report of my clinic on "Cancer of the Stomach," which appeared in the January, 1927, number (page 7) of the SOUTHERN MEDICAL JOURNAL, the description of the case that was presented might possibly leave one under some doubt as to whether Drs. J. C. and Trimble Johnson were not responsible for the medical treatment of the patient from the beginning of his symptoms. It should have been definitely mentioned in the account of this case that Drs. Johnson saw the patient only a few weeks before he was presented at the clinic, and did not treat him during his first illness, or during the early course of the disease. The patient was doubtless inoperable when they first saw him, and their treatment gave as much temporary improvement as could be expected.

I have recently heard from Dr. Trimble Johnson that he has lost touch with the patient but reports have come to him that the patient is failing rather rapidly.

I trust that as a matter of justice to Drs. Johnson you will publish this letter.

Very sincerely yours,

J. SHELTON HORSLEY, M.D.

Richmond, Virginia, January 20, 1927.

1. Stehle, R. L.: Diuretic Anti-Diuretic Action of Pituitrin. Amer. Jour. Physiol., 74: 289, Jan. 1927.

Book Reviews

Diseases of the Skin. By Richard L. Sutton, M.D., LL.D., F.R.S. (Edin.), Professor of Diseases of the Skin, University of Kansas School of Medicine; Assistant Surgeon, United States Navy, Retired; Member of the American Dermatological Association; Dermatologist to the Atchison, Topeka and Santa Fe Hospital Association; Dermatologist to the Christian Church Hospital. Sixth Edition, revised and enlarged. 1303 pages with 1147 illustrations and 11 colored plates. St. Louis: C. V. Mosby Co. Cloth, $12.00.

The sixth edition of Sutton's well known "Diseases of the Skin," 1303 pages, just off the Mosby press, is a distinct improvement of this invaluable work.

Always comprehensive, a number of the newer dermatoses which have been identified as clinical entities in recent years, such as mycotic paronychia, congenital ectodermal aplasia, cheilitis actinica chronic, etc., have been added.

The book has always been rich in fine illustrations, probably exceeding in this respect any other in print in this Country. Many new photographs are found in this edition. Eight hundred new literary references have been appended, too, bringing the bibliography up to date.

The volume is unreservedly recommended.

Southern Medical News

ALABAMA

The Jefferson County Medical Society has elected Dr. Cecil D. Gaston, Birmingham, President; Dr. George Williamson, Bessemer, Vice-President; Dr. Walter B. Hardy, Birmingham, Secretary.

Houston County Medical Society has elected Dr. Henry Green, Dothan, President, succeeding Dr. J. Arthur Keyton.

A bronze tablet in honor of the late Dr. Richard P. Huger, Anniston, will be placed in St. Michael's Episcopal Church.

Dr. William D. Sellers has been appointed a municipal physician for Birmingham.

Dr. David C. Jordon, Guntersville, has been appointed Health Officer of Marshall County.

Dr. James D. Holliman and Miss Josephine Nichols, both of New Hope, were married November 24.

Deaths

Dr. James Luther Akins, Kinston, aged 41, died November 11 of chronic nephritis.

Dr. John Meredith Bonds, Bessemer, aged 47, died November 9 at a local hospital following an operation for appendicitis.

Dr. James Henry Ferrell, Birmingham, aged 52, died recently of arterio-sclerosis.

Dr. J. T. Kent, Birmingham, aged 56, died recently.

Dr. Thomas Jefferson Springfield, Ensley, aged 77, died November 3 of chronic nephritis.

Dr. Oscar Lee Rivenbark, Hartford, aged 52, died September 31 of cerebral hemorrhage.

(Continued on page 34)

THE safety of complete sterilization with economy and convenience is the exclusive advantage of the new Castle 1515. It sterilizes dressings, water and instruments easily, and as they should be.

Back of every Castle sterilizer are years of research in correct sterilizing technique. This 1515 is therefore so complete and correct as to be a virtual necessity in every busy office.

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Manufacturing Distributors in Great Britain, Short & Mason, Ltd., London

There is a *Tycos* or Taylor Temperature Instrument for Every Purpose

(Continued from page 170)

ARKANSAS

Craighead County Medical Society has elected Dr. S. W. Moreland, President; Dr. Ira Ellis, First Vice-President; Dr. Robert B. Burns, Second Vice-President; Dr. Thad Cothern, Secretary; Dr. W. C. Overstreet, Treasurer.

Dr. H. D. Wood, Fayetteville, at a banquet given in his honor by the Central Presbyterian Church, was presented with a gold watch in recognition of the completion of fifty consecutive years of faithful service as elder of that Church.

Deaths

Dr. E. L. Garner, Mammoth Spring, aged 47, died suddenly October 18 of heart disease.

Dr. R. L. Grant, Texarkana, aged 62, died December 6.

Dr. Robert Hardin, Cummins, aged 44, died November 22.

Dr. W. H. Moorhead, Stuttgart, aged 62, died suddenly December 2.

Dr. Roy Rice, North Little Rock, aged 48, died November 18.

Dr. Hiram L. Throgmorton, Pocahontas, aged 58, died November 30.

DISTRICT OF COLUMBIA

The Clinical Club of Washington, composed of local physicians, was organized recently, with Dr. Everett M. Ellison as President; Dr. J. Winthrop Peabody, Vice-President; Dr. Harry S. Bernton, Secretary and Treasurer; Drs. Fred O. Coe, S. Carl Hanning and William J. Stanton, Executive Committee.

The National Tuberculosis Association, which met in Washington in October, elected Dr. Geo. M. Kober, Washington, Secretary.

Deaths

Dr. Walter Wheeler Alleger, Washington, aged 66, died September 30 at Silver Springs, Maryland, of cerebral hemorrhage.

Dr. William Francis Magruder, Washington, aged 32, died recently of tuberculosis.

Dr. Joshua Robert Hayes, Washington, aged 96, died November 4 of heart disease.

Dr. Louis Alward Johnson, Washington, aged 56, died November 28 of heart disease.

Dr. John Ryder Wellington, Washington, aged 61, died November 20 of myocarditis following a long illness.

FLORIDA

The Florida Midland Medical Society has elected Dr. Robert L. Cline, Lakeland, President, and Dr. Burdette Smith, Tampa, Secretary.

Seminole County Medical Society, which has been a part of Orange County Medical Society, has formed an organization of their own. Dr. Sam Puleston, Sanford, was elected President; Dr. J. W. Martin, Oveido, Vice-President; Dr. Chas. Park, Sanford, Secretary-Treasurer.

Dr. J. M. Hoffman, Pensacola, has been appointed Acting Secretary of the Escambia County Medical Society and will complete the term of the former Secretary, Dr. Herbert Snyder. Dr. Snyder was forced to resign owing to serious illness in his immediate family.

Dr. Burrel C. Wilson, formerly Director of the Grayson County (Kentucky) Health Unit, has been appointed Field Medical Officer for the State Board of Health of Florida for the Jacksonville District.

Dr. Joseph Y. Porter, Sr., has been elected President of the Key West Chamber of Commerce for the fifth consecutive year.

Dr. T. W. Causey's Hospital at Lakeland was closed on November 10.

Dr. Julian L. Hargrove has been appointed Business Manager of the Polk County Hospital, Bartow.

Dr. Archie McCallister has been appointed City Health Physician of Tarpon Springs.

Drs. Pennington and Pennington, of Lake Wales, have opened a private hospital at that place.

(Continued on page 36)

Dermatological Clinics Are Aided by Photography

What is so hard to describe as a skin infection—and yet it is no harder to photograph than a black mark on a sheet of paper. And the photograph is an accurate—scientifically accurate—record while the description is accurate only to its author and to him for only a limited time. Photographs may be interpreted by all. Ask an Eastman Demonstrator to tell you more about clinical photography.

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CHICAGO

(Continued from page 34)

Dr. M. A. Lischkoff, Pensacola, has been received as a Fellow of the American College of Surgeons.

Dr. S. B. Forbes and Mrs. Helen M. Willis, both of Tampa, were married on November 6.

Deaths

Dr. Charles Roy Darrow, Fort Lauderdale, aged 55, died October 23.

Dr. Clement Lanier Richardson, Jacksonville, aged 85, died December 3. After practicing his profession in Louisiana over fifty years, Dr. Richardson came to Florida to reside with his son, Dr. Shaler Richardson.

Dr. Louis A. Simmon, Auburndale, aged 76, died in October at the home of his daughter in Tampa.

GEORGIA

Sumter County Medical Society has elected Dr. Sam P. Wise, Plains, President; Dr. J. F. Lunsford, Preston, Vice-President, and Dr. Ford Ware, Americus, Secretary.

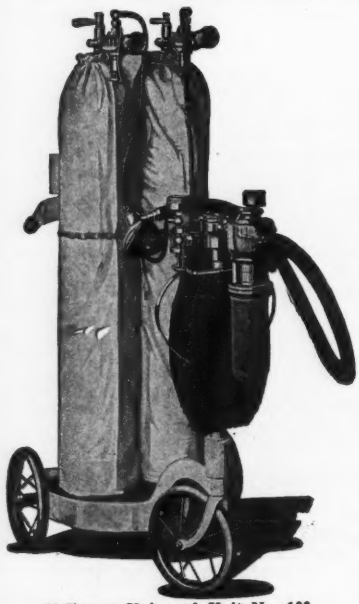
Tenth District Medical Society has elected Dr. C. S. Jernigan, Sparta, President.

A prize to be known as the Crawford W. Long Memorial Prize for Research Work is to be presented yearly for the best piece of original work of merit accomplished by any member of the Medical Association of Georgia in good standing, this being given by a donor who is interested in the scientific progress of medicine and in stimulating research work in Georgia. For the first time this prize is to be competed for at the next annual meeting of the Medical Association of Georgia in Athens, May, 1927. Dr. Wm. R. Dancy, 102 West Jones Street, Savannah, is Chairman of the Committee, and any information desired by a contestant can be obtained from him.

Augusta has been selected for the next convention of the Southern Surgical Association.

Dr. Cleveland Thompson, Millen, was made a Fel-

(Continued on page 38)



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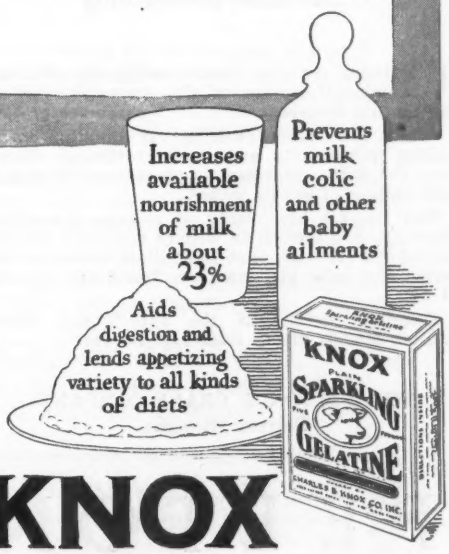

AT first, laboratory tests proved the discovery. Then, experiments with groups of children (such as the one recently conducted at the Christian Herald Children's home) confirmed it. And now, physicians in all sections of the country are reporting gratifying results in treating malnutrition with Knox Gelatine and milk. When the gelatine is dissolved and added to the milk, its protective colloidal ability greatly assists full digestion—it increases the available nourishment of milk about 23%. *Because it is unflavored, uncolored and unsweetened* only Knox Gelatine should be prescribed.

Method of Combining Gelatine with Milk:

Add one teaspoonful of Knox Sparkling Gelatine—which should first be soaked ten minutes in a little cold milk and then dissolved over hot water or in hot milk—to the glass of milk. (In infant feeding formulas use 1 tablespoonful of gelatine, dissolved as above, to the quart of milk.)

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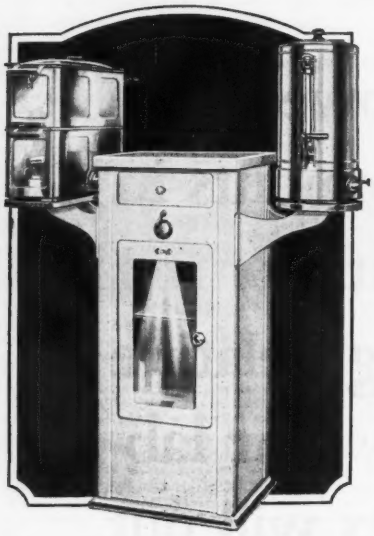

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Indestructible Sterilizers

(Continued from page 36)

low of the American College of Surgeons at a meeting held in Montreal, Canada.

Emory University School of Medicine has added to the faculty Dr. M. T. Stringer, Instructor in Pathology; Dr. E. D. Shanks, Bacteriology; Dr. W. A. Smith, Neurology; Dr. R. S. Leadingham, Medicine; Dr. R. C. Pendergrass, Roentgenology; Dr. G. A. Williams, Assistant in Surgery; Dr. I. A. Ferguson, Assistant in Surgery; Dr. E. S. Colvin, Gynecology and Obstetrics; Dr. Keith C. Rice, Assistant in Surgery; Dr. L. W. Grove, Associate in Surgery.

The City of Waycross and Ware County have planned to raise $150,000 by 1931 to erect and equip a standard fireproof hospital which will measure up to every requirement of the American College of Surgeons. The City and County have each agreed to appropriate $15,000 annually for five years.

Dr. Wm. H. Garrison, Clarkesville, has been elected by the Council as a member of the City Board of Health.

Dr. Samuel Kahn, formerly with the Kings Park State Hospital for the Insane of New York, is now associated with Dr. N. M. Owensby, Atlanta.

Dr. Stewart D. Brown, Royston, is converting the Franklin Hotel into a modern hospital.

Dr. E. O. Scharnitzky, Augusta, was elected third Vice-President of the American Prison Physicians' Association at the convention held in Pittsburg, Pa., recently.

The addition to the Little-Griffin Hospital, Valdosta, will increase the capacity of the hospital about 50 per cent.

Miss Virginia Gibbs, Marietta, was elected President of the Georgia State Association of Graduate Nurses at a meeting held in Savannah October 23.

Mrs. Eva Tupman, Atlanta, was elected President of the State Association of Public Health Nursing.

Dr. Zachariah W. Jackson and Miss Virginia Ewing, both of Atlanta, were married October 2.

Deaths

Dr. James P. Ballenger, Armuchee, aged 70, died October 31 of uremia.

Dr. William Wallace Bruce, Thomasville, aged 71, died October 14 of carcinoma of the rectum.

Dr. John T. Cobb, Buchanan, aged 59, died recently at Cedartown of chronic nephritis.

Dr. Alexander H. Culpepper, Homerville, aged 66, died October 12 of heart disease.

Dr. Madison Finley Pennington, Columbus, aged 42, died October 24 of cerebral hemorrhage.

Dr. William J. Hood, commerce, aged 37, died recently.

Dr. Robert Grigg Reese, of Augusta and New York City, aged 60, died October 18.

Dr. H. C. Walker, Augusta, aged 25, died October 21 of injuries received in an automobile accident.

Dr. John L. Weaver, Baxley, aged 74, died suddenly October 17.

Dr. Jacob Weichselbaum, Savannah, aged 78, died October 5 of intestinal obstruction following an operation for hernia.

KENTUCKY

Cumberland Medical Association, composed of physicians from Whitley, Knox, Laurel, Bell and Harlan Counties, was organized recently and elected Dr. W. H. Martin, Harlan, President; Dr. Corum, Corbin, Secretary and Treasurer; and the Vice-Presidents will be composed of the presidents of the five various county medical societies.

The State Bureau of Maternal and Child Health has arranged for graduate work in obstetrics and has secured Dr. Alice W. Tallant, for many years Professor of Obstetrics, Women's Medical College, Philadelphia, Pa., to conduct the courses.

Mrs. Helen D. Coyle, R.N., formerly of the Robinson Hospital, Berea, is the new Superintendent of the Clark County Hospital, Winchester.

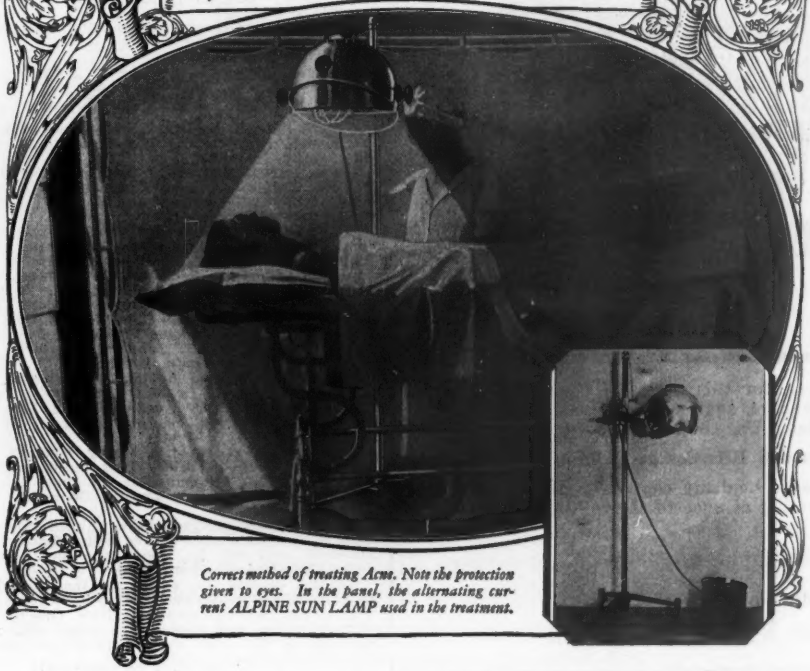
Deaths

Dr. J. S. Durette, Horse Cave, aged 59, died October 11 of organic heart disease.

Dr. Thomas Clifton Coons, Lexington, aged 77, died October 21 as the result of an injury received in a fall two years ago.

(Continued on page 40)

The ALPINE SUN LAMP



Correct method of treating Acne. Note the protection given to eyes. In the panel, the alternating current ALPINE SUN LAMP used in the treatment.

Suggested Technique for the Treatment of Acne: *Protect eyes and eyelids of patient. See that hair is brushed back, so that rays can reach edge of scalp. Expose each side of face, administering a third degree erythema. Repeat two or three times as old reaction subsides.*

QUARTZ LIGHT THERAPY is conceded by many eminent dermatologists to be one of the most resultful modalities in the treatment of Acne. Entirely safe, the rapid improvement under ultraviolet radiation is gratifying to patient and doctor.

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(Continued from page 38)

Dr. William C. Martin, Clay City, aged 51, died October 13 of cerebral hemorrhage.

Dr. Henry Clay Reid, Edmonton, aged 85, died November 11 of senility.

Dr. Benjamin S. Seay, Louisville, aged 62, died October 9 of heart disease.

LOUISIANA

Fourth District Medical Society has elected Dr. John L. Scales, Shreveport, President, and Dr. Scott, Shreveport, Secretary.

Iberia Parish Medical Society has elected Dr. P. A. Boykin, Jeanerette, President; Dr. H. A. King, New Iberia, Vice-President; Dr. W. F. Carstens, New Iberia, Secretary-Treasurer.

Lafourche Parish Medical Society has elected Dr. Charles Barker, Thibodaux, President; Dr. Albert Meyer, Thibodaux, Vice-President; Dr. Philip Dansereau, Thibodaux, Secretary-Treasurer.

Orleans Parish Medical Society has elected Dr. A. E. Fossier, President; Dr. John F. Dicks, First Vice-President; Dr. C. Grenes Cole, Second Vice-President; Dr. E. L. King, Third Vice-President; Dr. H. Theodore Simon, Secretary; Dr. John A. Lanford, Treasurer; Dr. Daniel N. Silverman, Librarian.

Shreveport Medical Society has elected Dr. I. B. Rougon, President; Dr. R. S. Douglass, First Vice-President; Dr. R. T. Lucas, Second Vice-President; Dr. E. L. Edwards, Secretary; Dr. J. R. Stamper, Treasurer.

The cornerstone of the Mercy Hospital, New Orleans, was recently laid. This building will contain forty-one private rooms and six small wards on the first and second floors. The top floor will be used for obstetrical cases.

The Greenwell Springs Tuberculosis Hospital, Baton Rouge, opened December 25 with quarters for fifty patients, and will be under the supervision of the State Tuberculosis Commission.

At the annual convention of the Radiological Society of North America, held in Milwaukee, Wis., recently, Dr. Amedee Granger, New Orleans, was presented with a gold medal, this being awarded in recognition of his work on the sphenoidal sinuses. The

(Continued on page 42)

Competent Clinical Observers

agree that the tendency to acidosis in Influenza and Pneumonia is very high. Meet this by prescribing Kalak Water in sufficient amounts to keep the urine always neutral.

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We have also developed a type of cooker which is being successfully operated on the large steam trawlers while they are far out at sea.

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Why not a trial prescription?

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Yonkers, New York

(Continued from page 40)

additional honor of being made Vice-President for the coming year was also conferred upon him.

Dr. Henry J. Bayon, Jr., a recent graduate of Tulane University Medical School, has received an appointment to the staff of the American Hospital of Paris. Dr. Bayon is the son of Dr. Henry Bayon, Professor of Anatomy at Tulane.

Dr. Patrick H. Fleming was recently elected Mayor of St. Martinville.

Deaths

Dr. James McArthur Griffin, New Orleans, aged 34, died recently of streptococcus infection and pneumonia.

Dr. G. H. Ogbourne, Tallulah, aged 68, died in August of cardiorenal disease.

Dr. William F. Sibley, Robeline, aged 57, died August 19 of arterioscleroses.

MARYLAND

Dr. Guy Hunner, of the Johns Hopkins Hospital of Baltimore, was elected President of the Southern Surgical Association at its annual meeting held in Biloxi in December.

Dr. William H. Howell, Assistant Director and Professor of Physiology, Johns Hopkins University School of Hygiene and Public Health, will succeed Dr. William H. Welch as Director.

MISSISSIPPI

The Tri-County Medical Society has elected Dr. A. B. Harvey, Tylertown, President; Dr. M. D. Ratcliff, McComb, Pike County, Dr. J. E. Brumfield, Tylertown, Walthall County, Dr. G. T. Warren, Brookhaven, Lincoln County, and Dr. J. M. Catchings, McComb, Copiah County, Vice-Presidents; Miss Elise Rutledge, McComb, Secretary-Treasurer.

Warren County Medical Society, now known as Issaquena-Sharkey-Warren Medical Society, has elected Dr. Edley H. Jones, Vicksburg, President; Dr. W. H. Scudder, Mayersville, Dr. A. K. Barrier, Rolling Fork, and Dr. J. L. Clark, Vicksburg, Vice-Presidents; Dr. Leon S. Lippincott, Vicksburg, Secretary and Treasurer.

Dr. William B. Harrison, for the last two years Health Officer of Pearl River County, has been appointed County Health Officer of Jones County to succeed Dr. John M. Kittrell, resigned.

Deaths

Dr. J. W. Armistead, Greenwood, aged 48, died October 16.

Dr. Hiram D. Glass, Lambert, aged 50, died November 6 of heart disease.

MISSOURI

The Western Physiotherapy Association will hold its ninth annual meeting in Kansas City April 8-9 under the presidency of Dr. Lynne B. Greene, of Kansas City. Full information may be obtained from the Secretary, Dr. Charles Wood Fassett, 115 East Thirty-First Street, Kansas City.

Buchanan County Medical Society has elected Dr. B. T. Quigley, President; Dr. E. A. Gummig, First Vice-President; Dr. Charles Greenberg, Second Vice-President; Dr. Roger Moore, Treasurer.

Boone County Medical Society has elected Dr. Lloyd Simpson, President; Dr. W. R. Shaefer, Vice-President; Dr. Hugh P. Muir, Secretary-Treasurer.

Lafayette County Medical Society has elected Dr. W. E. Koppenbrink, Higginsville, President; Dr. R. C. Schooley, Odessa, First Vice-President; Dr. J. Q. Cope, Lexington, Second Vice-President; Dr. Edmund Lissack, Concordia, Secretary-Treasurer.

Laclede County Medical Society has elected Dr. C. E. Carleton, Stoutland, President; Dr. J. G. Scott, Lebanon, Vice-President; Dr. J. M. Billings, Lebanon, Secretary-Treasurer.

Nodaway County Medical Society has elected Dr. C. D. Humberd, Barnard, President; Dr. R. C. Person, Maryville, Vice-President; Dr. H. S. Dowell, Maryville, Secretary.

(Continued on page 44)

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Its use is a guarantee against milk-borne infections. The finer fat globule and friable curd---which are produced mechanically---promote digestion and assimilation.

Fundamental Bases for Every Formula:

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Based on the original formula. Recognized as the protein milk of choice by the hundreds of pediatrists who have used it continuously for five years. Prepared in home and hospital with equal facility.

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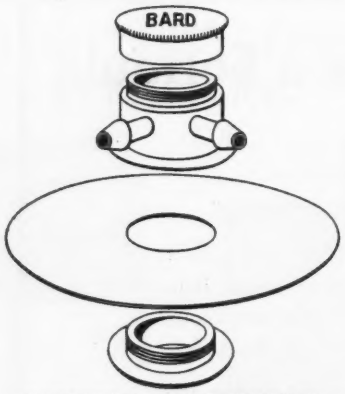

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BEERS' SUPRAPUBIC DRAINAGE
CUP
(See J. A. M. A., Aug. 28, 1926)
FITS ANY TYPE ABDOMEN
ANY DEALER

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NEW YORK CITY

(Continued from page 42)

Saline County Medical Society has elected Dr. F. A. Howard, Slater, President; Dr. G. S. Hardin, Marshall, First Vice-President; Dr. John H. Owens, Sweet Springs, Second Vice-President; Dr. H. R. Conway, Marshall, Secretary-Treasurer.

St. Louis County Medical Society has elected Dr. H. N. Corley, Webster Groves, President; Dr. C. E. Barnett, Kirkwood, Vice-President; Dr. C. C. Irick, Webster Groves, Secretary-Treasurer.

Southwest Missouri Medical Society has elected Dr. William A. Delzell, Springfield, President.

Missouri and Kansas physicians specializing in neurology and psychiatry have organized the Missouri-Kansas Neuropsychiatric Society and elected Dr. Karl Menninger, Topeka, Kansas, President; Dr. F. A. Carmichael, Osawatomie, Kansas, Vice-President; Dr. E. T. Gibson, Kansas City, Secretary.

St. Luke's Hospital, St. Louis, has just completed the addition of a clinic pavilion to the Hospital, the gift of Mr. Edward Mallinckrodt, President of the Board of Managers of the Hospital. The furnishings were provided by gifts from Mrs. Newton Wilson and the late Mrs. Fannie Carr. The Hospital has also received a $50,000 gift from Mrs. William H. Keech to endow two rooms in the hospital in memory of her parents.

The St. Louis Medical Society has been presented with a bronze plaque of the portrait medallion of Dr. James Moores Ball by Mr. Victor S. Holm, Sculptor, who is connected with the School of Fine Arts of Washington University. Dr. Ball, Dr. Amand Ravold and the late Dr. Frank J. Lutz were the founders of the St. Louis Medical Library. A bronze plaque of Dr. Lutz made by Clara Pfiefer Carrett was presented to the Society in 1915 by some of the members.

Dr. Edwin C. Ernst, St. Louis, was elected President of the Radiological Society of North America at the annual meeting held in Milwaukee recently.

Dr. George A. Auerswald, De Soto, has been appointed Medical Advisor of the Workmen's Compensation Commission.

Dr. James R. Lee, Charleston, has been elected

(Continued on page 46)

IMPORTANT IMPROVEMENT IN STETHOSCOPE

Dr. Howard B. Sprague
Boston

For complete description see Journal of A. M. A., June 19, 1926.

Chest Piece only.....$5.00

Stethoscope complete.....$6.00

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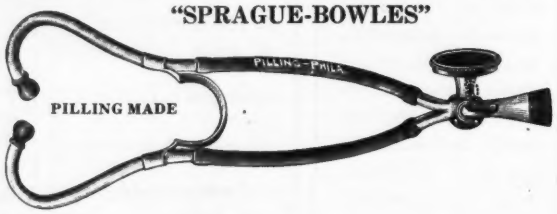

Enlarged view of chest piece, showing Bell, Bowles Disc and Control Valve.

Combining the well known Bowles Diaphragm and regular Bell in one instrument. Complete cardiac diagnosis requires the application of both types, as not all heart sounds are best transmitted by either one, the complete instrument meeting adequately all diagnostic requirements. Change from disc to bell or reverse is made by simply turning the valve.

From Surgical Instrument and Hospital Supply Department

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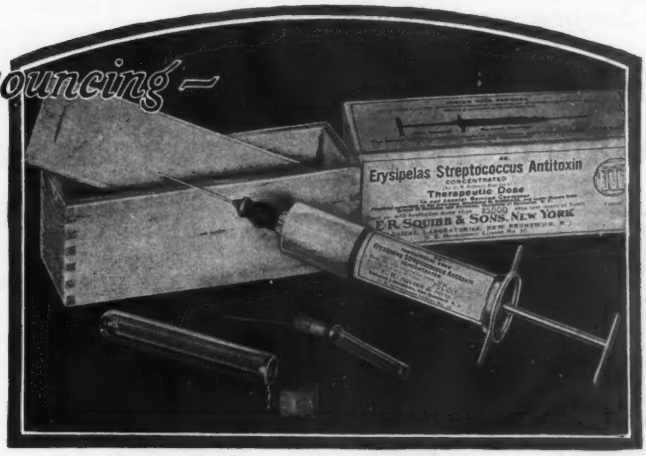

Erysipelas Antitoxin

For the Treatment of Streptococcus Erysipelas

TO E. R. SQUIBB & SONS was issued on May 20th, 1926, the first license ever granted by the U. S. Public Health Service for the interstate sale of Erysipelas Streptococcus Antitoxin.

Erysipelas Antitoxin Squibb is prepared under license from the School of Medicine and Dentistry of the University of Rochester, New York, and is made according to the principles developed by DR. KONRAD E. BIRKHAUG of that University, and reported in the *Journal of the American Medical Association* for May 8, 1926, page 1411.

In addition to the tests made in the Squibb Biological Laboratories, samples of each lot of Erysipelas Antitoxin Squibb are submitted to the School of Medicine and Dentistry of the University of Rochester for approval before distribution.

Erysipelas Antitoxin Squibb is supplied in concentrated form only. It is dispensed only in syringes containing one average "Therapeutic Dose."

Write to our Professional Service Department for Further Information

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In Sickness—or in Health

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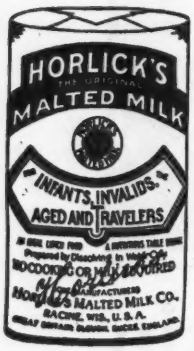

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Avoid Imitations Prescribe the Original

Horlick's Malted Milk Corporation
RACINE, WISCONSIN

(Continued from page 44)

President of the Southeast Missouri Medical Association.

A permit has been issued to St. Anthony's Hospital, St. Louis, for a seven-story addition to cost $400,000.

Deaths

Dr. Jesse W. Cartlich, Kansas City, aged 80, died November 12 of mitral stenosis.

Dr. Baylis Chamblin, St. Louis, aged 69, died in October of chronic nephritis and mitral stenosis.

Dr. Joseph McDowell Patterson, Kansas City, aged 61, died December 6.

Dr. George L. Sherman, formerly of St. Joseph, died December 24 at Frankfort, South Dakota.

Dr. Ira W. Seybold, Poplar Bluff, aged 57, died November 12 of heart disease.

NORTH CAROLINA

The City of Gastonia and the Gaston County Commissioners have provided a budget of $4,000 annually for a ten bed addition to the local hospital for negro tuberculosis patients.

Mr. Fred L. Seely, Asheville, has donated to the Mission Hospital of that City $6,000 for the purchase of a new roentgen-ray outfit in memory of his family physician.

The Watts Hospital, Durham, has contracted for an addition, which will contain fifty-five rooms and cost $172,000.

Dr. Thomas E. Tucker, Health Officer of Edgecomb County, resigned October 15 to accept a similar position in Jackson County, Alabama, with headquarters at Scottsboro.

Dr. Margery J. Lord has been appointed School Physician for Asheville on a full-time basis.

Dr. W. Clinton Linville has been appointed Acting Superintendent of the State Hospital for Colored Insane, Goldsboro, pending an election of a Superintendent by the Board to succeed the late Dr. William W. Faison.

(Continued on page 48)

Specify— MERRELL'S SALICYLATES

SOPHISTICATION of birch oil is so widespread that no manufacturer can guarantee the integrity of his label unless he distills the oil from which his "natural" salicylates are produced.

It requires 750 pounds of fresh birch brush, which must be hauled long distances over almost impassable roads, to be chopped and distilled, to produce one pound of Sodium Salicylate *Merrell.* But isn't it worth it?

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THE WM. S. MERRELL COMPANY, CINCINNATI
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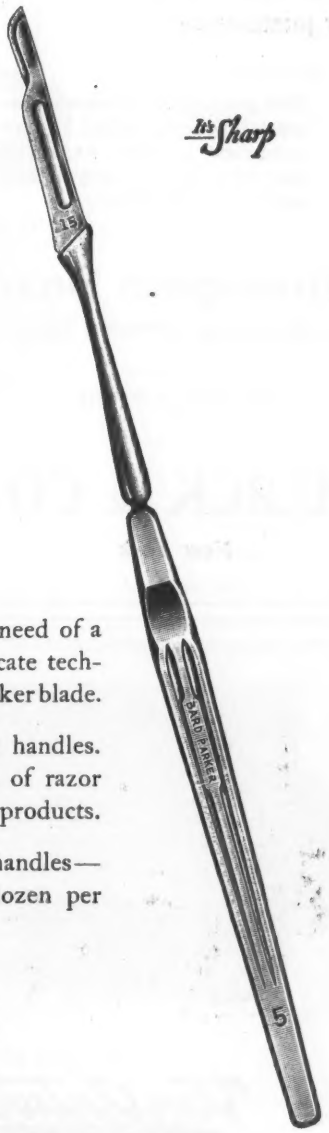

TO those who have long felt the need of a small sharp cutting edge for delicate technique—we introduce this new Bard-Parker blade.

The No. 15 blade fits Nos. 3 and 5 handles. It maintains the same high standard of razor sharpness found in all Bard-Parker products.

No. 3 handles—$1.00 each. No. 5 handles—$1.50 each. No. 15 blades—half dozen per package—$1.50 per dozen.

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A specific treatment for pneumonia

Morgenroth's chemotherapeutic specific ethyl hydrocupreine is now available for the use of physicians under the name of

Numoquin Base

ETHYL HYDROCUPREINE MERCK

Literature on request

MERCK & CO.

New York

(Continued from page 46)

OKLAHOMA

The University of Oklahoma Extension Division has, in recent months, put on three circuits of postgraduate instruction in the central and southern part of the State, and about 400 physicians have registered for these courses. New circuits in pediatrics are being organized in other sections of the State, and still other courses will be organized as the demand for them becomes apparent.

Dr. Paul H. Fesler, Superintendent, State University Hospital, Oklahoma City, has been appointed Superintendent of the University of Minnesota Hospital, Minneapolis, Minn.

Deaths

Dr. Andrew Charles Bullard, Quinton, aged 71, died July 14 of myocarditis.

Dr. James A. Jackman, Dawson, aged 62, died November 6 of heart disease.

SOUTH CAROLINA

Greenville County Medical Society has elected Dr. George R. Wilkinson, Greenville, President; Dr. Irving Barksdale, Greenville, Secretary, reelected; Dr. Hugh Smith, Greenville, Treasurer.

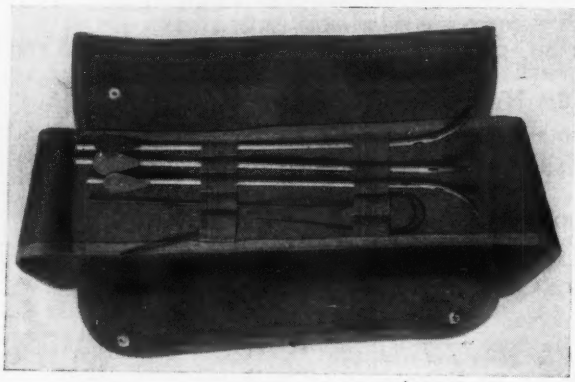
Pee Dee Medical Association has elected Dr. J. A. Norton, Conway, President, and Dr. S. C. Henslee, Dillon, Secretary.

Columbia Medical Society has elected Dr. T. A. Pitts, President; Dr. R. K. Foster, Vice-President; Dr. B. H. Baggott, Secretary-Treasurer.

Pickens County Medical Society has elected Dr. L. G. Clayton, Central, President; Dr. Wm. Furman, Easley, Vice-President; Dr. J. L. Bolt, Easley, Secretary.

Third District Medical Association has elected Dr. R. E. Hughes, Laurens, President, and Dr. C. J. Scurry, Greenwood, Secretary.

(Continued on page 50)



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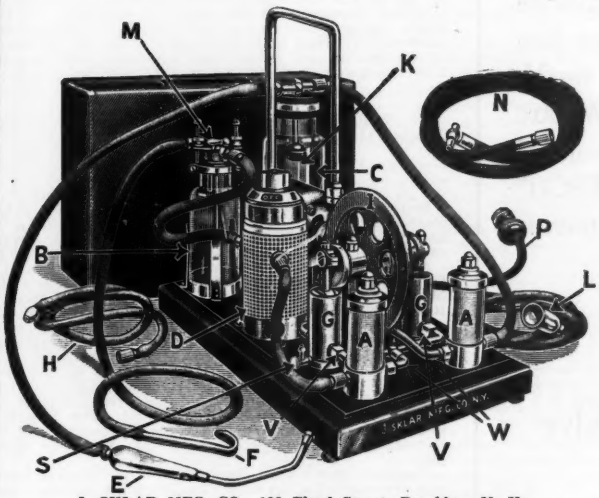

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Manhattan Eye Salve Company

Louisville, Kentucky.

(Continued from page 48)

The faculty of the Medical College of the State of South Carolina, Charleston, announces that the privilege of borrowing periodicals and other publications on file in the Library is now extended to all legally qualified members of the medical profession of the State, subject to certain restrictions. The physician must pay postage both ways; material will be loaned as a rule for not more than ten days; and security must be given to the value of the material loaned.

Deaths

Dr. William W. Fennell, Rock Hill, aged 58, died October 11 following a long illness.

TENNESSEE

Memphis and Shelby County Medical Society has elected Dr. George R. Livermore, President; Dr. A. G. Jacobs, Vice-President; Dr. T. N. Coppedge, Treasurer, reelected; Dr. A. F. Cooper, Secretary, reelected.

Middle Tennessee Medical Society has elected Dr. William W. Porter, Springfield, President; Dr. Evander M. Sanders, Nashville, Vice-President; Dr. Sam P. Bailey, Nashville, Secretary-Treasurer, reelected.

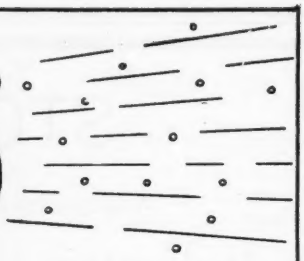
The Memphis Urological Society has elected Dr. J. L. Morgan, President; Dr. I. G. Duncan, Vice-President; Dr. H. K. Turley, Secretary-Treasurer.

The Southern Interurban Clinical Club of Internists held its fifteenth semi-annual meeting in Nashville January 7-8, the organization being the guest of the Vanderbilt University Medical School. The President is Dr. I. I. Lemann, New Orleans, Louisiana, and the Secretary-Treasurer is Dr. Bryce W. Fontaine, Memphis.

Contract was signed recently whereby present working arrangement between the Memphis General Hospital and the College of Medicine, University of Tennessee, is to continue for the next fifty years. The City of Memphis is to maintain the Hospital, while the Medical School provides the medical and nursing care and has full teaching privileges. The medical

(Continued on page 52)

Relief of COUGHS Without Opiates



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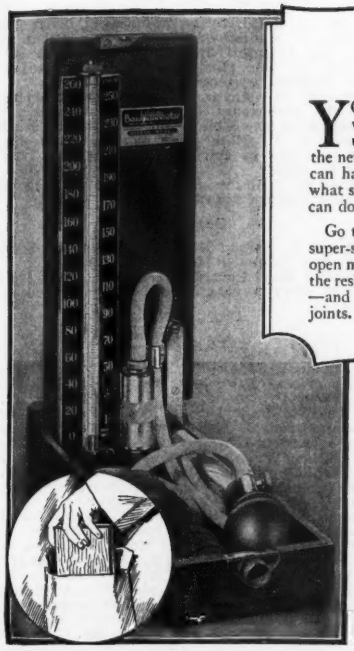

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— *such an instrument as this!*

YOU may be thoroughly familiar with sphygmo-manometers, but unless you have seen and used the new *Lifetime* Baumanometer, you can have no adequate conception of what such an instrument can be and can do for you.

Go to your dealer and examine this super-service instrument. Go with an open mind and a critical eye. Observe the resiliently-mounted *Cartridge Tube* —and mark the absence of cemented joints. Think of what it means— no more weeks of waiting for your instrument to come back from the factory * * * Consider the fact that it is *guaranteed against breakage for your lifetime.*

Then make your purchase, sure in the knowledge that you have acquired an instrument which possesses not only all of the virtues pioneered by the original Baumanometer (of which there are more than 50,000 in use), but others which you cannot begin to appreciate until you see them!

Lifetime Baumanometer

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The Cartridge Tube

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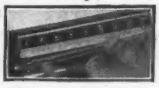

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Calcreose: A powder, containing approximately 50 per cent beechwood creosote in chemical combinations with calcium.
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To obtain the full benefit of creosote medication in tuberculosis and bronchitis the dose must be sufficiently large.

This is what makes Calcreose so valuable.

Calcreose practically eliminates the possible disturbing effects of plain creosote, thus making it feasible to give large doses of this valuable drug over long periods of time and insuring therapeutic effect.

Whenever you want the stimulating expectorant effect of creosote, use Calcreose.

Calcreose is a loose chemical combination of creosote and hydrated calcium oxide. It represents about 50% creosote in tablet form. It is easily administered and particularly suitable as an adjunct to other remedial measures.

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Indications: Headache, neuralgia, dysmenorrhea, myalgia, and the pains and aches of colds, etc.

For prompt analgesic results specify *The Dependable Original* PYRAMIDON.

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(Continued from page 50)

Board of the Hospital, to be nominated by the dean of the College of Medicine, is to be composed of chief of staff of the Hospital and a representative of the six divisions of the Hospital—medicine, pediatrics, laboratory, surgery, gynecology and obstetrics.

Dr. Alphonse H. Meyer, Memphis, was elected a Fellow of the American College of Surgeons at the recent meeting of the College in Montreal, Canada.

Dr. Augustus A. Oliver has been elected Health Officer of the City of Paris, succeeding the late Dr. Armistead H. Miller.

Dr. Rodney R. Williams has resigned as Director of the Memphis Child Guidance Clinic.

Deaths

Dr. William R. Baker, Nashville, aged 59, died October 18 at the Hubbard Hospital of pyelitis.

Dr. Maynard Ray Pickett, Memphis, aged 32, died December 25 after having been fatally injured by an automobile.

TEXAS

Texas Surgical Society has elected Dr. Kenneth Aynesworth, Waco, President; Dr. J. E. Clark, Houston, First Vice-President; Dr. C. W. Flynn, Dallas, Second Vice-President; Dr. H. L. D. Kirkham, Houston, Secretary; Dr. J. B. Smoot, Dallas, Treasurer.

The State Homeopathic Medical Society has elected Dr. H. B. Stiles, Waco, President, reelected; Dr. Nora Donohoe, Dallas, First Vice-President; Dr. T. A. Bryan, Martins Mill, Second Vice-President; Dr. W. D. Gorton, Austin, Secretary-Treasurer.

The Fourth Annual Texas Short School for Sanitarians and Health Workers has elected Dr. L. H. Martin, Fort Worth, President; Mr. C. C. Hays, Waco, First Vice-President; Mr. C. M. Adams, Texarkana, Second Vice-President; Mr. E. W. Steel, College Station, Third Vice-President; Mr. Bud A. Randolph, Fourth Vice-President; Dr. A. H. Flickwir, Houston, Representative of the Governing Council, A. P. H. A.; Mr. E. G. Eggert, Austin, Secretary; Mr. C. N. Avery,

(Continued on page 54)

Allen H. Bunce, A.B., M.D., F.A.C.P. George F. Klugh, B.S., M.D. Raiford T. Warnock, M.D. Jackson W. Landham, M.D.

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These laboratories are equipped for making every test of clinical value in the diagnostic study of medical and surgical cases. Only standardized methods and technique are used.

In addition to the diagnostic study of cases there are adequate facilities for the x-ray and radium treatment of conditions in which these forms of treatment are indicated.

Containers for pathological specimens and information in reference to x-ray and radium work furnished upon request.

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Established 1866
NEW ORLEANS

(Continued from page 52)

Dr. Holman Taylor, Dr. H. O. Sappington, Mr. H. W. Van Hovenberg, Mrs. Margaret Conger, Mr. V. M. Ehlers, Dr. C. M. Rosser, Richard P. Hall, L. O. Bernhagen, Dr. A. H. Speer, Dr. W. A. King, Dr. A. H. Flickwir and Mr. Homer N. Calver, Advisory Council.

The Sealy Hospital, Santa Anna, has organized a nurses' training school, under the direction of Dr. T. R. Sealy, founder of the Hospital.

Dr. Jesse A. Flautt, Galveston, has been elected County Health Physician to succeed the late Dr. Joseph S. Jones.

Dr. Allen Grant Flythe and Miss Catherine Elizabeth Rasbury, both of Dallas, married November 10.

Deaths

Dr. C. O. Bryan, Center, aged 59, died in November of encephalitis.

Dr. William Byrd Pinson, Abilene, aged 60, died October 11 following a long illness.

Dr. Oliver Henry Radkey, Austin, aged 51, died October 22 of chronic nephritis.

Dr. Harry Hinkle Stark, El Paso, aged 58, died October 22 of tuberculosis.

Dr. William Terry, Dilley, aged 68, died October 6 of chronic myocarditis.

Dr. Roy Emmons Truly, Denison, aged 34, died October 30 following an appendectomy.

Dr. W. E. Wolford, Allen, aged 79, died October 14.

VIRGINIA

Halifax County Medical Society has elected Dr. George A. Stover, South Boston, President, to succeed the late Dr. H. S. Belt, and Dr. J. A. Owen, Turbeville, Secretary-Treasurer.

Dr. Alexander G. Brown, Jr., Richmond, has resigned from the faculty of the Medical College of Virginia after about twenty-five years of service as a teacher in that school.

Dr. Herbert R. Drewry, Norfolk, has been elected

(Continued on page 56)

The Management of an Infant's Diet

Mellin's Food—A Milk Modifier

Constipation

It is common observance among physicians who use Mellin's Food as a modifier of milk for infant feeding that their baby patients are seldom troubled with constipation, and if this annoying symptom does occasionally appear it is easily corrected by increasing the amount of Mellin's Food in the daily mixture or by some other slight readjustment of the formula.

Some fault in the arrangement of the food formula is practically always the cause of constipation, so it seems logical to overcome the difficulty by rearranging the food elements to a more perfect balance rather than to employ medical means, which at best afford temporary relief only.

In a pamphlet entitled, "Constipation in Infancy", the common causes of constipation are set forth for the physician's consideration, also practical suggestions for their correction. All of the matter presented is based upon observation extending over a long period and will prove of good service to every physician interested in the subject.

A copy of the pamphlet will be sent promptly upon request. Samples of Mellin's Food also if desired.

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All the little kiddies I treat in the future for diphtheria shall have the benefits of Super-Concentrated Antitoxin

My first interest is their prompt recovery and it is obvious that the smaller volume of Super-Concentrated Antitoxin may be absorbed in less time and thus produce quicker results. The smaller volume will minimize the pain of every patient.

The reduced protein content of Super-Concentrated Antitoxin minimizes the occurrence of urticaria and serum sickness.

Sparkling, clear amber color and free from cloudiness and turbidity.

And the Mulford Antitoxin Syringe, with its non-stick plunger, glass-encased sterile needle and non-slip finger rest, saves my time and insures a satisfactory injection.

This is the perfected combination I have wanted for many years and now it is available to any physician in Mulford Super-Concentrated Diphtheria Antitoxin.

Less Bulk—Less Pain—Quicker Results.

Mail the coupon if you want further information.

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Please send me, without charge, water-filled sample showing size and style of Super-Concentrated Antitoxin Syringe.

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FOR SALE—Mississippi practice, well established in county seat, population 4000, progressive town—drawing population 30,000. Good schools, churches and roads. Will sell for $500.00, price of drugs and fixtures. Splendid opportunity. Specializing. Write M. J. E., care Journal.

(Continued from page 54)

President of the Association of Surgeons of the Norfolk and Western Railway.

Dr. Lazarus Karp, Richmond, has established a loan fund at the Medical College of Virginia, Richmond, in memory of his brother, an alumnus of that school who died in 1918. This is for students who have difficulty in meeting expenses of their medical education.

Dr. David B. Lepper, formerly connected with health work in Virginia, is now Health Officer of Bluefield, West Virginia.

Dr. Mosby G. Perrow, Health Officer of Lynchburg, has been elected President of the Washington and Lee alumni chapter in that City.

Dr. Bernard S. Steinberg, who was connected with the house staff of Memorial Hospital, Richmond, but recently of Cleveland, Ohio, has been appointed Director of Research and Laboratories at the Toledo Hospital, Toledo, Ohio.

Miss Olivia Shortt, for the past six years Superintendent of the Petersburg hospital, is the new Superintendent of the Clarksville Hospital, Clarksville, Tenn., succeeding Miss Sarah Neblett.

Dr. Joseph Thompson Graham, Draper, and Miss Elsie Carlize Krengel, Richmond, were married recently.

Dr. Richard J. Beck, Neuropsychiatrist of the U. S. Veterans' Bureau, Richmond, and Dr. Regena Johnson, Pathologist to Stuart Circle Hospital, Richmond, were married at Dr. Johnson's home in Bridgeport, Ohio, October 8.

Dr. Harry F. White, Fishersville, and Miss Germaine Brutsche were married recently.

Dr. Henry Leroy Townsend, Richmond, and Miss Ellen Douglass Pippen, Littleton, N. C., were married December 1.

Dr. Samuel Bee Woodward and Mrs. Margaret Wood, of National Soldiers Home, were married in November.

Deaths

Dr. W. J. Crittenden, Orange, aged 67, died recently.

Dr. Luther S. Mason, Clover, aged 73, died October 14 of exhaustion following acute gastritis.

Dr. William P. McGuire, Winchester, aged 80, died November 15 after a short illness.

Dr. Edward Dabney Starke, Norfolk, aged 51, died November 21 of heart disease.

Dr. Isaac Webb Surratt, Belspring, aged 53, died October 20.

WEST VIRGINIA

Cabell Medical Society has elected Dr. F. C. Hodges, Huntington, President; Dr. J. W. Rife, Kenova, Vice-President; Dr. C. G. Willis, Huntington, and Dr. R. M. Bobbitt, Huntington, both reelected Secretary and Treasurer, respectively.

Fayette County Medical Society has elected Dr. H. A. Walkup, Mount Hope, President, reelected; Dr. A. L. Hunter, Pax, First Vice-President; Dr. A. L. Morris, Jodie, Second Vice-President; Dr. G. A. Smith, Montgomery, Secretary-Treasurer.

(Continued on page 58)

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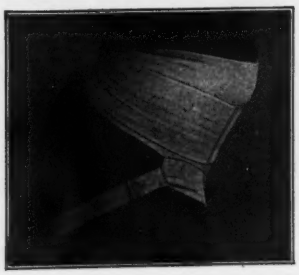

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(Continued from page 56)

Greenbrier Valley Medical Society has elected Dr. D. G. Preston, Lewisburg, President; Dr. J. D. Arbuckle, Maxwellton, Vice-President; Dr. C. F. Mahood, Alderson, Secretary-Treasurer.

Barbour-Randolph-Tucker Medical Society has elected Dr. E. M. Hamilton, Belington, President; Dr. T. M. Wilson, Elkins, First Vice-President; Dr. J. L. Miller, Thomas, Second Vice-President; Dr. J. C. Irons, Dartmoor, Secretary-Treasurer, reelected.

Harrison County Medical Society has elected Dr. Cecil O. Post, Clarksburg, President; Dr. A. J. Kemper, Lost Creek, Vice-President; Dr. B. Steele Brake, Clarksburg, Secretary; Dr. E. A. Teets, Clarksburg, Treasurer.

Kanawha County Medical Society has elected Dr. R. H. Dunn, South Charleston, President; Dr. T. M. Barber, Charleston, First Vice-President; Dr. D. N. Barber, Owens, Second Vice-President; Dr. H. B. Robins, Charleston, Secretary-Treasurer.

Marion County Medical Society has elected Dr. L. N. Yost, Fairmont, President; Dr. G. R. Miller, Fairview, First Vice-President; Dr. C. J. Carter, Fairmont, Secretary; Dr. C. W. Waddell, Fairmont, Treasurer, reelected.

McDowell County Medical Society has elected Dr. R. V. Shanklin, President; Dr. S. A. Daniels, Vice-President; Dr. A. G. Rutherford, Secretary; Dr. H. G. Camper, Treasurer.

Raleigh County Medical Society has elected Dr. T. F. Garrett, Sprague, President; Dr. D. L. Hill, Wickman, First Vice-President; Dr. D. B. Jarrell, Beckley, Second Vice-President; Dr. E. S. Dupuy, Beckley, Secretary-Treasurer.

Dr. Richard Talbott and Miss Thelma Butt were married in October and now are residing in Hinton.

Deaths

Dr. Florence Buhrman Evers, Martinsburg, aged 43, died September 21 at a hospital in Baltimore, Md., following an operation.

Dr. Samuel R. Fairchild, Elk Ridge, aged 39, died recently.

Dr. Charles Beall Waggener, Arbuckle, aged 76, died July 3 at Point Pleasant of heart disease.

THE STANDARD

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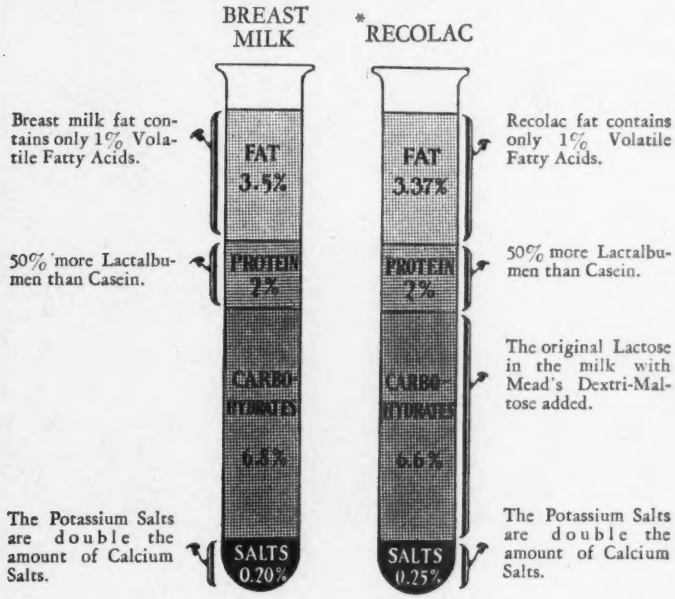
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